



UPPER EAST COAST

WATER SUPPLY PLAN UPDATE

Planning Document/Appendices



2021

A

Water Demand Projections

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The South Florida Water Management District (SFWMD or District) develops water demand estimates and projections in coordination with stakeholder groups, other agencies, utilities, and local governments. **Chapter 2** provides summary information, and this appendix describes the methods used to develop water demand estimates for 2019 and projections through 2045 for the Upper East Coast (UEC) Planning Area. Demands are developed for six water use categories: Public Supply (PS), Domestic Self-Supply (DSS), Agriculture (AG), Commercial/Industrial/Institutional (CII), Landscape/Recreational (L/R), and Power Generation (PG). Water demand estimates and projections are provided in 5-year increments through 2045 for average rainfall and 1-in-10-year drought conditions. In addition, demands are described and analyzed in two ways: gross (or raw) demand and net (or finished) demand.

POPULATION ESTIMATES AND PROJECTIONS

This section presents the methodology used to develop the 2019 population estimates and 2045 population projections for the UEC Planning Area, which are essential to determining water demands. The University of Florida's Bureau of Economic and Business Research (BEBR) provides population estimates and projections at the county level; however, water supply planning requires population projections at the sub-county level to delineate DSS areas and PS utility service areas. Section 373.709(2)(a)1, Florida Statutes (F.S.), prescribes the use of population projections in determining water supply needs in regional water supply plans.

In accordance with Section 373.709(2)(a)1, F.S., permanent resident estimates and projections for each county, published by BEBR (Rayer and Wang 2020), were used as the basis for population projections in this 2021 UEC Plan Update. BEBR county population estimates and projections are also used by local governments in their Comprehensive Plans. While the most recent medium BEBR projections were used for Martin and northeastern Okeechobee counties, high BEBR projections were used for St. Lucie County because of it is used in the county's comprehensive planning efforts. The St. Lucie County Transportation Planning Organization formally adopted the high BEBR projection for its long-term transportation plans, and the high BEBR projection will be part of other elements of the county's Comprehensive Plan. For Okeechobee County, adjustments were made to the medium BEBR projections to include only the northeastern portion of the county within the UEC Planning Area. Adjustments were made based on the distribution of 2010 census blocks (United States Census Bureau 2012). The 2019 permanent resident populations within the UEC Planning Area were as follows:

◆ Martin County:	158,598 permanent residents
◆ St. Lucie County:	309,357 permanent residents
◆ Okeechobee County:	544 permanent residents

Utility Service Areas

To establish current and future PS and DSS populations, each PS utility's 2019 and 2045 potable water service area was delineated. A utility service area refers to the area with water distribution infrastructure and water customers served by a particular PS utility. The SFWMD developed 2019 and 2045 utility service area maps based on information from utilities and the SFWMD's water use permit database. Accuracy of the service area maps was verified through correspondence with all PS utilities. Note that there are no PS utilities in the northeastern portion of Okeechobee County within the UEC Planning Area boundary.

Population Projection Methodology

Census block populations from the 2010 census (United States Census Bureau 2012) and 2019 PS service area maps were used to estimate the 2019 permanent resident populations for PS utilities and DSS areas. Each census block within the UEC Planning Area was assigned to a PS service area or DSS area. The distribution of population in census blocks not entirely within a single PS service area or DSS area was based on visual comparison of residential land use coverage. PS service area and DSS population estimates for 2015 through 2019 were calculated by applying annual county growth rates published by BEBR (Rayer and Wang 2020) to 2010 population estimates.

Detailed sub-county population projections from county planning departments were assigned to PS utility service areas and DSS areas. In some cases, modifications were made to service area populations based on information from local land use planning maps and local government Comprehensive Plans. Population projections to 2045 were calculated using traffic analysis zone data developed by the transportation planning organizations in Martin and St. Lucie counties. The data provide distributions of population growth within each county using traffic analysis zones and are integral to comprehensive planning efforts. Population growth provided by the traffic analysis zones was applied to PS utility service areas and DSS areas. These results were adjusted proportionally to match the latest set of county population projections from BEBR (Rayer and Wang 2020), in accordance with Section 373.709, F.S.

Population Projection Results

Table A-1 presents the results of the population distributions by county and PS utility (or DSS area) from 2019 to 2045. The results were shared with and reviewed by utility, municipal, and local government staff. The populations shown in **Table A-1** indicate the UEC Planning Area will have an additional 217,910 permanent residents by 2045, an increase of approximately 47%. The City of Port St. Lucie Utility Systems Department has the largest current and future populations, accounting for almost half of the region's projected 2045 PS population.

Table A-1. Service area population projections in the UEC Planning Area.

PS Utility or DSS	2019	2020	2025	2030	2035	2040	2045
Martin County							
Indiantown, Village of	6,367	6,447	6,943	7,383	7,767	8,122	8,455
Jupiter, Town of (Martin portion)	2,257	2,285	2,416	2,527	2,617	2,697	2,770
Martin County Utilities	94,163	95,352	101,153	106,077	110,170	113,844	117,215
Port St. Lucie Utility Systems Department, City of (Martin portion)	1,609	1,629	1,670	1,694	1,703	1,706	1,705
Sailfish Point	1,054	1,068	1,095	1,112	1,119	1,122	1,122
South Martin Regional	21,126	21,392	22,286	22,973	23,473	23,882	24,228
St. Lucie Mobile Village	801	811	844	869	887	901	913
Stuart, City of	20,596	20,856	21,707	22,356	22,823	23,201	23,518
Tequesta, Village of (Martin portion)	3,533	3,578	3,679	3,743	3,777	3,795	3,804
PS Total	151,506	153,418	161,793	168,734	174,336	179,270	183,730
DSS Total	7,092	7,181	7,706	8,166	8,564	8,930	9,271
Martin County Total	158,598	160,599	169,499	176,900	182,900	188,200	193,001
St. Lucie County							
Fort Pierce Utilities Authority	46,615	49,060	53,432	46,267	49,269	52,038	54,635
Harbour Ridge	1,042	1,093	1,165	1,237	1,295	1,348	1,397
Martin County Utilities (St. Lucie portion)	1,934	2,012	2,065	2,119	2,150	2,173	2,192
Meadowood Communities Association	589	654	654	654	654	654	654
Port St. Lucie Utility Systems Department, City of	186,206	198,658	226,252	253,834	278,245	301,107	322,742
Reserve Community Development District	3,353	3,485	3,564	3,644	3,685	3,713	3,735
Spanish Lakes Country Club	1,649	1,781	1,781	1,781	1,781	1,781	1,781
Spanish Lakes Fairway	2,241	2,319	2,322	2,327	2,307	2,280	2,251
St. Lucie County Utilities	14,883	16,024	19,517	34,546	49,022	52,887	56,544
St. Lucie West Services District	13,785	13,785	13,785	13,785	13,785	13,785	13,785
PS Total	272,297	288,871	324,537	360,194	402,193	431,766	459,716
DSS Total	37,060	38,630	40,063	41,506	31,907	32,532	33,085
St. Lucie County Total	309,357	327,501	364,600	401,700	434,100	464,298	492,801
Okeechobee County*							
PS Total	0	0	0	0	0	0	0
DSS Total	544	547	564	577	589	598	607
Okeechobee County Total	544	547	564	577	589	598	607
UEC Planning Area							
PS Total	423,803	442,289	486,330	528,928	576,529	611,038	643,446
DSS Total	44,696	46,358	48,333	50,249	41,060	42,060	42,963
UEC Planning Area Total	468,499	488,647	534,663	579,177	617,589	653,096	686,409

DSS = Domestic Self-Supply; PS = Public Supply; UEC = Upper East Coast.

* Values listed are only for the area within the UEC Planning Area boundary. No PS utilities are located in the portion of Okeechobee County within the UEC Planning Area.

Comparing this 2021 UEC Plan Update population projection to those published in the 2011 and 2016 UEC plan updates can provide insight into the importance of population growth rates based on BEBR projections. Prior to the national economic downturn in 2008, high rates of development in the region pointed to higher population growth rates (**Figure A-1**). The population projections in the 2011 UEC Plan Update were a result of higher population growth rates prior to the recession. The BEBR projections used in this 2021 UEC Plan Update indicate slower growth rates from previous plan updates. However, they are closely aligned with the projections published in the 2016 UEC Plan Update.

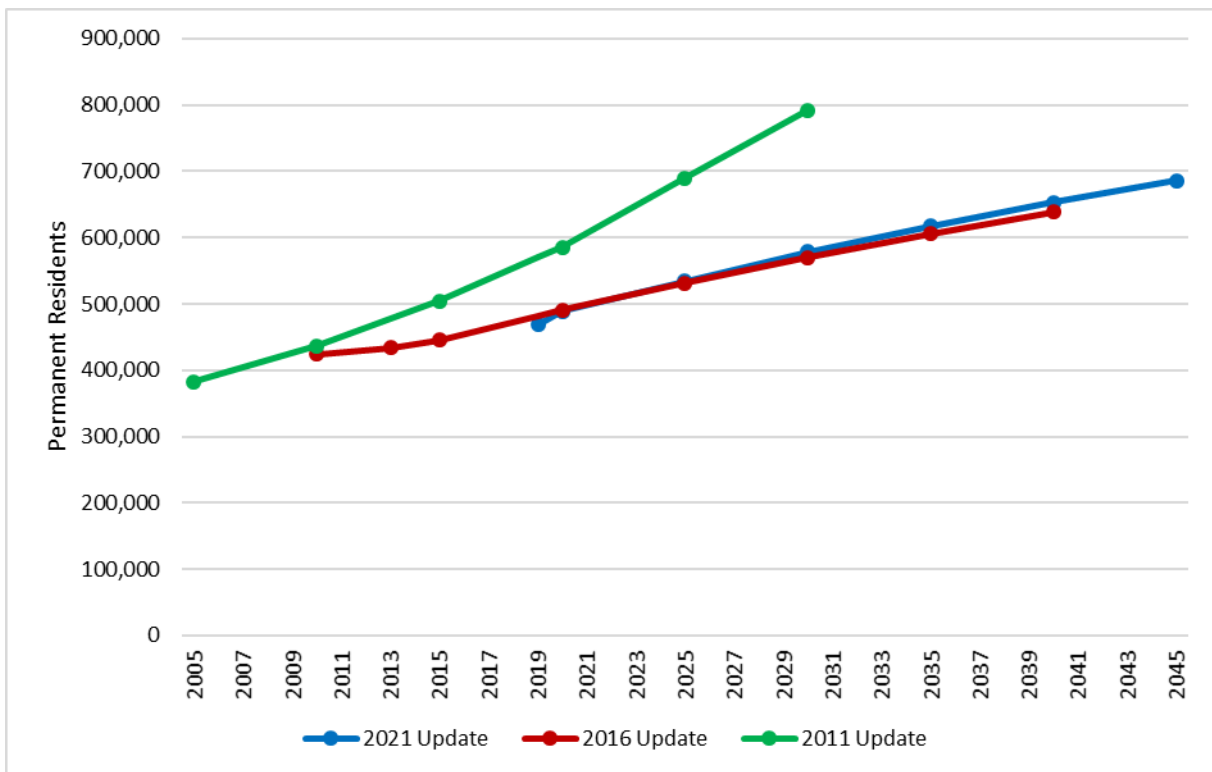


Figure A-1. Comparison of population projections from the 2011, 2016, and 2021 UEC water supply plan updates.

PUBLIC SUPPLY

The PS category includes potable water supplied by water treatment plants with a current allocation of 0.10 million gallons per day (mgd) or greater. Developing PS demand projections in the UEC Planning Area was a multistep process that included determining PS utility service area and DSS populations, calculating per capita use rates (PCURs), and projecting future water needs.

NOTE

Perceived discrepancies in table totals are due to rounding.

PS Projection Methodology

Per Capita Use Rates

For each PS utility, a net (finished) water PCUR was developed by dividing the annual net (finished) water volume for 2015 through 2019 by the corresponding service area estimated population (permanent residents) for each year; then, the five annual PCURs were averaged (**Table A-2**). Net (finished) water volumes for 2015 through 2019 were obtained from the PS utility monthly operating reports submitted to the Florida Department of Environmental Protection (FDEP). The net (finished) water volume reported to the FDEP includes all water produced for permanent and seasonal residents; industrial, landscaping, and irrigation water supplied by PS utilities; and any water distribution losses. The resulting PCURs conform to guidance provided by the FDEP for consistent statewide water supply planning. Future water conservation savings (**Chapter 3**) were not factored into demand projections and PCURs due to water savings uncertainty. The UEC Planning Area county average PCURs were calculated by averaging PS and DSS PCURs, weighted by their respective permanent resident populations.

Table A-2. Average net (finished) water per capita use rates (in gallons per capita per day) in the UEC Planning Area.

County	PS Utility or DSS	2015-2019 Average PCUR
Martin	Indiantown, Village of	86
	Jupiter, Town of	201
	Martin County Utilities	108
	Sailfish Point	146
	South Martin Regional	177
	St. Lucie Mobile Village	112
	Stuart, City of	145
	Tequesta, Village of	261
	Martin County DSS	156
	Martin County	156
St. Lucie	Fort Pierce Utilities Authority	168
	Harbour Ridge	117
	Meadowood Communities Association	121
	Port St. Lucie Utility Systems Department, City of	89
	Reserve Community Development District	68
	Spanish Lakes Country Club	109
	Spanish Lakes Fairway	94
	St. Lucie County Utilities	72
	St. Lucie West Services District	122
	St. Lucie County DSS	124
	St. Lucie County	106
Okeechobee*	Okeechobee County DSS	99
	Okeechobee County	99
UEC Planning Area		128

DSS = Domestic Self-Supply; PCUR = per capita use rate; PS = Public Supply; UEC = Upper East Coast.

* Values listed are only for the area within the UEC Planning Area boundary. No PS utilities are located in the portion of Okeechobee County within the UEC Planning Area.

Finished to Raw Water Conversion

Net (finished) demands (**Table A-3**) were calculated by multiplying the PS utility service area or DSS area population and the 5-year average PCUR. Gross (raw) water withdrawals are the volumes needed from the water source(s) to produce the required net (finished) water volumes, considering water treatment process losses. Water use permit allocations for PS utilities are based on the gross (raw) water volume to meet service area demands. To determine gross (raw) water demand for each PS utility, net (finished) water projections were multiplied by raw-to-finished ratios (**Table A-4**), which are based on the treatment efficiency of each PS water treatment plant. For example, if a typical reverse osmosis treatment facility withdraws a gross (raw) volume of 10.00 mgd and produces 8.00 mgd of net (finished) water, its treatment losses are 20%. Therefore, its raw-to-finished ratio would be 1.25 (10 mgd divided by 8 mgd).

Table A-3. PS net (finished) water demands under average rainfall conditions in the UEC Planning Area.*

PS Utility	Net (Finished) Demand – Average Rainfall Conditions (mgd)						
	2019	2020	2025	2030	2035	2040	2045
Martin County							
Indiantown, Village of	0.55	0.55	0.60	0.63	0.67	0.70	0.73
Martin County Utilities	10.17	10.30	10.92	11.46	11.90	12.30	12.66
Sailfish Point	0.15	0.16	0.16	0.16	0.16	0.16	0.16
South Martin Regional	3.74	3.79	3.94	4.07	4.15	4.23	4.29
St. Lucie Mobile Village	0.09	0.09	0.09	0.10	0.10	0.10	0.10
Stuart, City of	2.99	3.02	3.15	3.24	3.31	3.36	3.41
Jupiter, Town of (Martin portion)	0.45	0.46	0.49	0.51	0.53	0.54	0.56
Port St. Lucie Utility Systems Department, City of (Martin portion)	0.14	0.15	0.15	0.15	0.15	0.15	0.15
Tequesta, Village of (Martin portion)	0.92	0.93	0.96	0.98	0.99	0.99	0.99
Martin County Total	19.20	19.45	20.46	21.30	21.96	22.53	23.05
St. Lucie County							
Fort Pierce Utilities Authority	7.83	8.24	8.98	7.77	8.28	8.74	9.18
Harbour Ridge	0.12	0.13	0.14	0.14	0.15	0.16	0.16
Martin County Utilities (St. Lucie portion)	0.21	0.22	0.22	0.23	0.23	0.23	0.24
Meadowood Communities Association	0.07	0.08	0.08	0.08	0.08	0.08	0.08
Port St. Lucie Utility Systems Department, City of	16.57	17.68	20.14	22.59	24.76	26.80	28.72
Reserve Community Development District	0.23	0.24	0.24	0.25	0.25	0.25	0.25
Spanish Lakes Country Club	0.18	0.19	0.19	0.19	0.19	0.19	0.19
Spanish Lakes Fairway	0.21	0.22	0.22	0.22	0.22	0.21	0.21
St. Lucie County Utilities	1.07	1.15	1.41	2.49	3.53	3.81	4.07
St. Lucie West Services District	1.68	1.68	1.68	1.68	1.68	1.68	1.68
St. Lucie County Total	28.17	29.83	33.30	35.64	39.37	42.15	44.78
UEC Planning Area							
UEC Planning Area Total	47.37	49.28	53.76	56.94	61.33	64.68	67.83

mgd = million gallons per day; PS = Public Supply; UEC = Upper East Coast.

* No PS utilities are located in the portion of Okeechobee County within the UEC Planning Area.

Table A-4. Raw-to-finished water adjustment ratios for PS utilities in the UEC Planning Area.*

County	PS Utility	Raw-to-Finished Ratio
Martin	Indiantown, Village of	1.03
	Jupiter, Town of (Martin portion)	1.25
	Martin County Utilities	1.20
	Sailfish Point	1.33
	South Martin Regional	1.13
	St. Lucie Mobile Village	1.33
	Stuart, City of	1.03
	Tequesta, Village of (Martin portion)	1.22
St. Lucie	Fort Pierce Utilities Authority	1.16
	Harbour Ridge	1.03
	Meadowood Communities Association	1.03
	Port St. Lucie Utility Systems Department, City of	1.21
	Reserve Community Development District	1.03
	Spanish Lakes Country Club	1.33
	Spanish Lakes Fairway	1.33
	St. Lucie County Utilities	1.33
	St. Lucie West Services District	1.33

PS = Public Supply; UEC = Upper East Coast.

* No PS utilities are located in the portion of Okeechobee County within the UEC Planning Area.

Treatment efficiencies were determined from information supplied in the water use permit and/or standard treatment process technical documents. The assumed losses are 0% for aeration/disinfection only, 3% for lime softening/flocculation, 15% for nanofiltration, and 25% for reverse osmosis. If a utility has more than one treatment method, the ratio reflects combined treatment efficiencies. Potable water treatment plants in the UEC Planning Area and their treatment processes are shown in **Figures A-2 and A-3**.

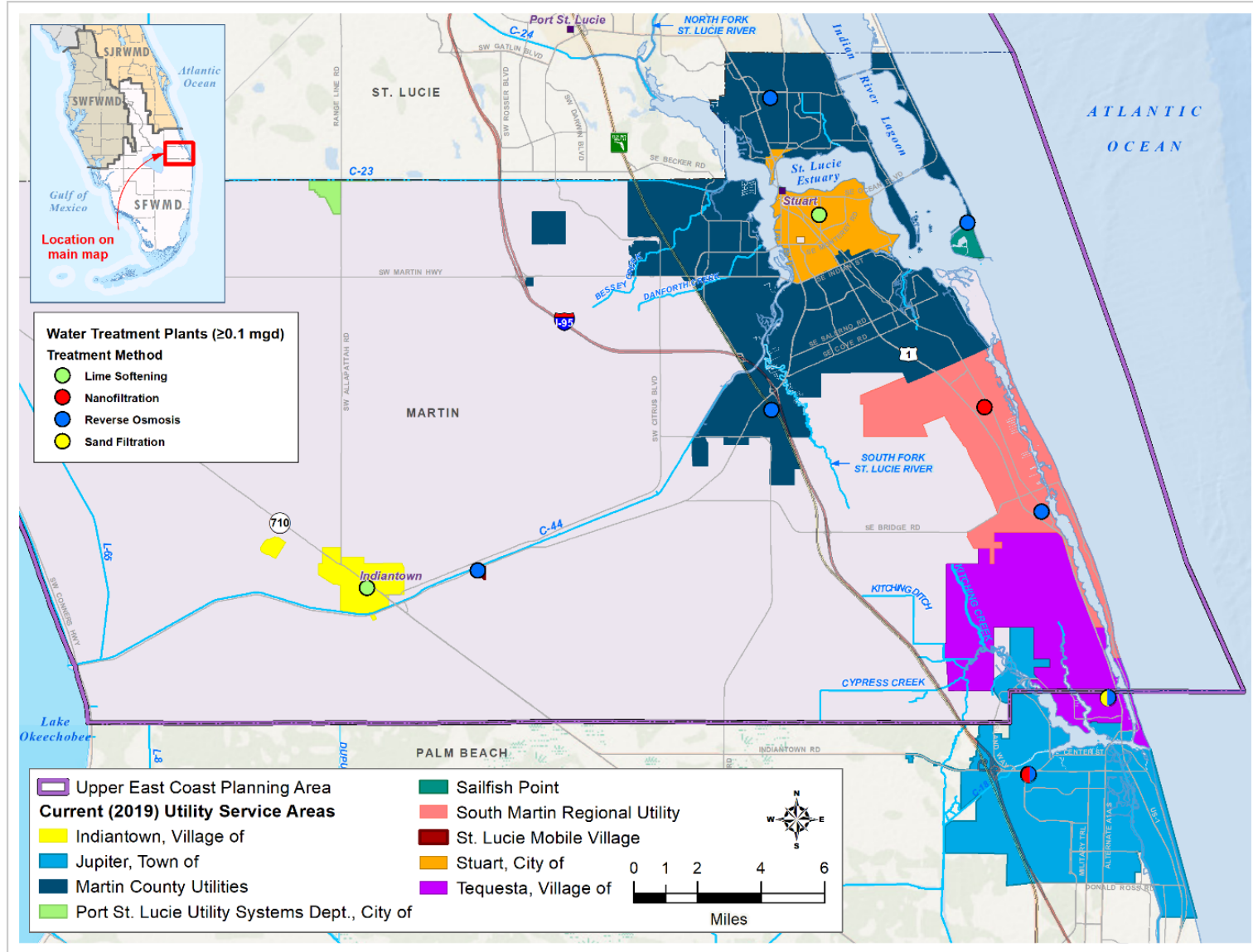


Figure A-2. Potable water treatment plants and Public Supply utility service areas in Martin County.

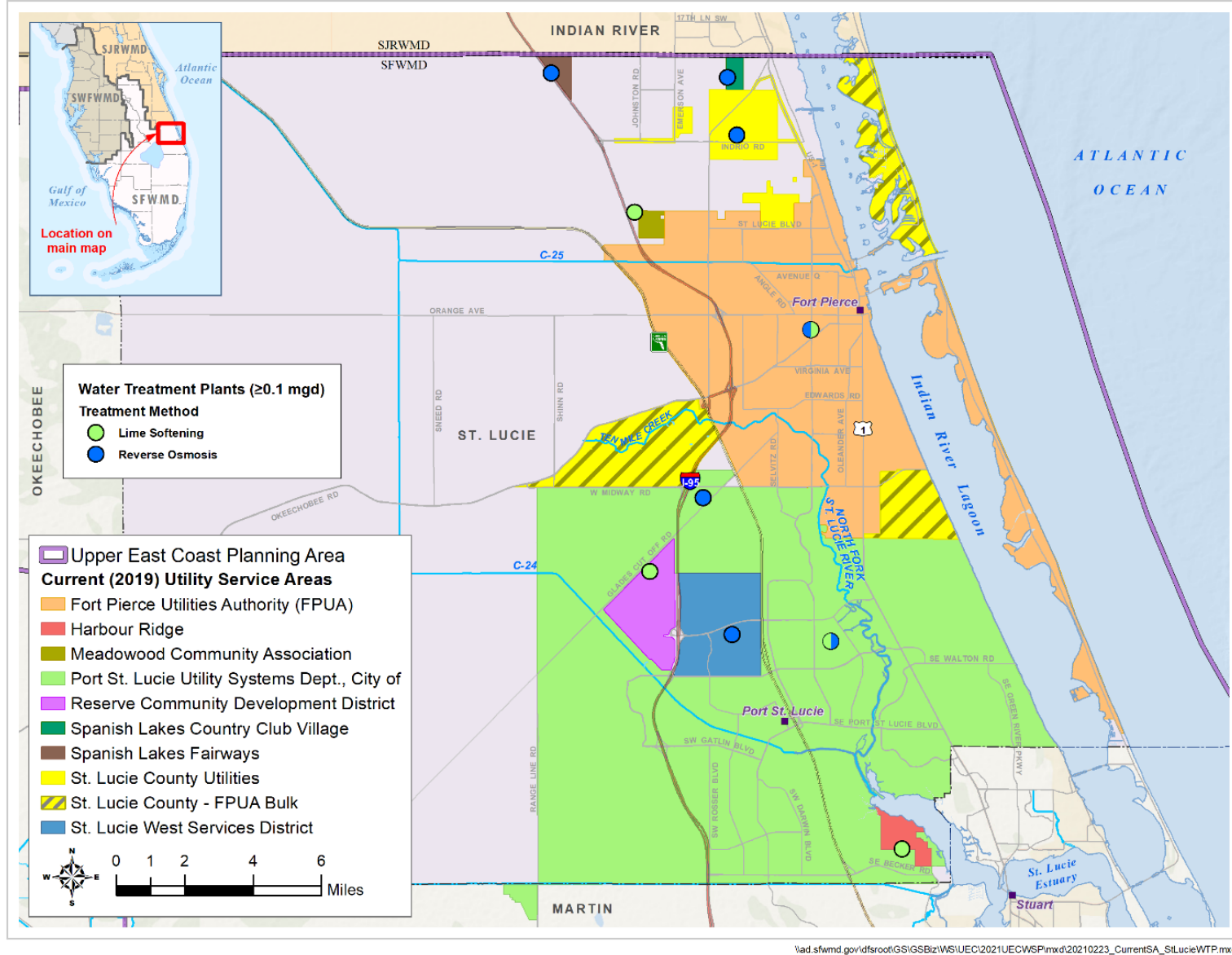


Figure A-3. Potable water treatment plants and Public Supply utility service areas in St. Lucie County.

PS Projection Results

Average Rainfall Conditions

Gross (raw) demands for PS under average rainfall conditions for 2019 through 2045 are provided in **Table A-5**.

Table A-5. PS gross (raw) water demands under average rainfall conditions in the UEC Planning Area.*

PS Utility	Gross (Raw) Demand – Average Rainfall Conditions (mgd)						
	2019	2020	2025	2030	2035	2040	2045
Martin County							
Indiantown, Village of	0.56	0.57	0.62	0.65	0.69	0.72	0.75
Jupiter, Town of (Martin portion)	0.57	0.57	0.61	0.63	0.66	0.68	0.70
Martin County Utilities	12.20	12.36	13.11	13.75	14.28	14.75	15.19
Port St. Lucie Utility Systems Department, City of (Martin portion)	0.17	0.18	0.18	0.18	0.18	0.18	0.18
Sailfish Point	0.20	0.21	0.21	0.22	0.22	0.22	0.22
South Martin Regional	4.23	4.28	4.46	4.59	4.69	4.78	4.85
St. Lucie Mobile Village	0.12	0.12	0.13	0.13	0.13	0.13	0.14
Stuart, City of	3.08	3.11	3.40	3.66	3.87	3.94	3.99
Tequesta, Village of (Martin portion)	1.13	1.14	1.17	1.19	1.20	1.21	1.21
Martin County Total	22.26	22.54	23.89	25.00	25.92	26.61	27.23
St. Lucie County							
Fort Pierce Utilities Authority	9.08	9.56	10.41	9.02	9.60	10.14	10.65
Harbour Ridge	0.13	0.13	0.14	0.15	0.16	0.16	0.17
Martin County Utilities (St. Lucie portion)	0.25	0.26	0.27	0.27	0.28	0.28	0.28
Meadowood Communities Association	0.07	0.08	0.08	0.08	0.08	0.08	0.08
Port St. Lucie Utility Systems Department, City of	20.05	21.39	24.37	27.34	29.96	32.43	34.76
Reserve Community Development District	0.23	0.24	0.25	0.26	0.26	0.26	0.26
Spanish Lakes Country Club	0.24	0.26	0.26	0.26	0.26	0.26	0.26
Spanish Lakes Fairway	0.28	0.29	0.29	0.29	0.29	0.29	0.28
St. Lucie County Utilities	1.43	1.53	1.87	3.31	4.69	5.06	5.41
St. Lucie West Services District	2.24	2.24	2.24	2.24	2.24	2.24	2.24
St. Lucie County Total	34.00	35.98	40.18	43.22	47.82	51.20	54.39
UEC Planning Area							
UEC Planning Area Total	56.26	58.52	64.07	68.22	73.74	77.81	81.62

mgd = million gallons per day; PS = Public Supply; UEC = Upper East Coast.

* No PS utilities are located in the portion of Okeechobee County within the UEC Planning Area.

1-in-10-Year Drought Conditions

Section 373.709, F.S., states that the level-of-certainty planning goal associated with identifying water demands shall be based on meeting demands during 1-in-10-year drought conditions. A 1-in-10-year drought is characterized by diminished rain and increased evapotranspiration relative to the historical record for a specific location. The increased PS demands during 1-in-10-year drought conditions were calculated using the method described in the *Districtwide Water Supply Assessment* (SFWMD 1998), which considers the increased demands on the irrigation portion of PS during droughts. The drought demand factors are 1.17 for Martin County, 1.09 for St. Lucie County, and 1.17 for northeastern Okeechobee County (within the UEC Planning Area). Average water demands were multiplied by the drought demand factor to calculate demands during 1-in-10-year drought conditions (**Tables A-6 and A-7**).

NOTE

Average Rainfall and 1-in-10-Year Drought

An **average rainfall** year is defined as a year with a rainfall amount that has a 50% probability of being exceeded in any other year.

A **1-in-10-year drought** is defined as a year in which below normal rainfall occurs, with a 90% probability of being exceeded in any other year. It has an expected return frequency of once in 10 years.

Table A-6. PS net (finished) water demands under 1-in-10-year drought conditions in the UEC Planning Area.*

PS Utility	Net (Finished) Demand – 1-in-10-Year Drought Conditions (mgd)						
	2019	2020	2025	2030	2035	2040	2045
Martin County							
Indiantown, Village of	0.64	0.65	0.70	0.74	0.78	0.82	0.85
Jupiter, Town of (Martin portion)	0.53	0.54	0.57	0.59	0.61	0.63	0.65
Martin County Utilities	11.87	12.02	12.75	13.37	13.89	14.35	14.77
Port St. Lucie Utility Systems Department, City of (Martin portion)	0.17	0.17	0.17	0.18	0.18	0.18	0.18
Sailfish Point	0.18	0.18	0.19	0.19	0.19	0.19	0.19
South Martin Regional	4.36	4.42	4.60	4.60	4.85	4.93	5.00
St. Lucie Mobile Village	0.10	0.11	0.11	0.11	0.12	0.12	0.12
Stuart, City of	3.49	3.53	3.67	3.78	3.86	3.93	3.98
Tequesta, Village of (Martin portion)	1.08	1.09	1.12	1.14	1.15	1.16	1.16
Martin County Total	22.42	22.71	23.88	24.70	25.63	26.31	26.90
St. Lucie County							
Fort Pierce Utilities Authority	8.54	8.98	9.78	8.47	9.02	9.53	10.00
Harbour Ridge	0.13	0.14	0.15	0.16	0.17	0.17	0.18
Martin County Utilities (St. Lucie portion)	0.23	0.24	0.24	0.25	0.25	0.26	0.26
Meadowood Communities Association	0.08	0.09	0.09	0.09	0.09	0.09	0.09
Port St. Lucie Utility Systems Department, City of	18.06	19.27	21.95	24.62	26.99	29.21	31.31
Reserve Community Development District	0.25	0.26	0.26	0.27	0.27	0.28	0.28
Spanish Lakes Country Club	0.20	0.21	0.21	0.21	0.21	0.21	0.21
Spanish Lakes Fairway	0.23	0.24	0.24	0.24	0.24	0.23	0.23
St. Lucie County Utilities	1.17	1.26	1.53	2.71	3.85	4.15	4.44
St. Lucie West Services District	1.83	1.83	1.83	1.83	1.83	1.83	1.83
St. Lucie County Total	30.72	32.52	36.28	38.85	42.92	45.96	48.83
UEC Planning Area							
UEC Planning Area Total	53.14	55.23	60.16	63.55	68.55	72.27	75.73

mgd = million gallons per day; PS = Public Supply; UEC = Upper East Coast.

* No PS utilities are located in the portion of Okeechobee County within the UEC Planning Area.

Table A-7. PS gross (raw) water demands under 1-in-10-year drought conditions in the UEC Planning Area.*

PS Utility	Gross (Raw) Demand – 1-in-10-Year Drought Conditions (mgd)						
	2019	2020	2025	2030	2035	2040	2045
Martin County							
Indiantown, Village of	0.66	0.67	0.72	0.76	0.80	0.84	0.87
Jupiter, Town of (Martin portion)	0.66	0.67	0.71	0.74	0.77	0.79	0.81
Martin County Utilities	14.24	14.42	15.30	16.04	16.66	17.22	17.73
Port St. Lucie Utility Systems Department, City of (Martin portion)	0.20	0.20	0.21	0.21	0.21	0.21	0.21
Sailfish Point	0.24	0.24	0.25	0.25	0.25	0.25	0.25
South Martin Regional	4.93	4.99	5.20	5.36	5.48	5.57	5.66
St. Lucie Mobile Village	0.14	0.14	0.15	0.15	0.15	0.16	0.16
Stuart, City of	3.59	3.64	3.97	4.27	4.52	4.59	4.66
Tequesta, Village of (Martin portion)	1.31	1.33	1.37	1.39	1.40	1.41	1.41
Martin County Total	25.97	26.30	27.88	29.17	30.24	31.04	31.76
St. Lucie County							
Fort Pierce Utilities Authority	9.90	10.42	11.35	9.83	10.47	11.05	11.61
Harbour Ridge	0.14	0.14	0.15	0.16	0.17	0.18	0.18
Martin County Utilities (St. Lucie portion)	0.27	0.28	0.29	0.30	0.30	0.31	0.31
Meadowood Communities Association	0.08	0.09	0.09	0.09	0.09	0.09	0.09
Port St. Lucie Utility Systems Department, City of	21.86	23.32	25.56	29.80	32.66	35.34	37.88
Reserve Community Development District	0.26	0.27	0.27	0.28	0.28	0.28	0.29
Spanish Lakes Country Club	0.26	0.28	0.28	0.28	0.28	0.28	0.28
Spanish Lakes Fairway	0.31	0.32	0.32	0.32	0.31	0.31	0.31
St. Lucie County Utilities	1.55	1.67	2.04	3.61	5.12	5.52	5.90
St. Lucie West Services District	2.44	2.44	2.44	2.44	2.44	2.44	2.44
St. Lucie County Total	37.07	39.23	42.79	47.11	52.12	55.80	59.29
UEC Planning Area							
UEC Planning Area Total	63.04	65.53	70.67	76.28	82.36	86.84	91.05

mgd = million gallons per day; PS = Public Supply; UEC = Upper East Coast.

* No PS utilities are located in the portion of Okeechobee County within the UEC Planning Area.

DOMESTIC SELF-SUPPLY

The DSS category includes potable water used by households that are served by small utilities with current allocations less than 0.10 mgd or that are self-supplied by private wells. Permanent resident populations within DSS areas were developed simultaneously with the PS population estimates and projections, as described earlier. All permanent residents outside of PS utility service area boundaries were considered DSS population. To determine the current and future DSS demands, the average PCUR of PS utilities in each county, weighted by the population (**Table A-2**), was multiplied by the DSS permanent resident population in each county. DSS county PCURs remain constant through 2045. For DSS demands, the raw-to-finished water ratio is assumed to be 1.00. Therefore, no distinction is made between gross (raw) and net (finished) water demands.

Tables A-8 and A-9 contain the UEC Planning Area's DSS demand estimates and projections under average rainfall and 1-in-10-year drought conditions, respectively. The drought demand factor used for PS was used to calculate 1-in-10-year drought demands for DSS. The average DSS demand in 2019 was 5.76 mgd for 44,695 permanent residents (**Table A-1**) and is expected to decrease to 5.61 mgd in 2045 due to expansion of PS utility service areas to serve current DSS areas.

Table A-8. DSS gross (raw) water demands under average rainfall conditions in the UEC Planning Area.

County DSS	Demand – Average Rainfall Conditions (mgd)						
	2019	2020	2025	2030	2035	2040	2045
Martin	1.11	1.12	1.20	1.27	1.34	1.39	1.45
St. Lucie	4.60	4.79	4.97	5.15	3.96	4.03	4.10
Okeechobee*	0.05	0.05	0.06	0.06	0.06	0.06	0.06
UEC Planning Area Total	5.76	5.96	6.23	6.48	5.36	5.48	5.61

DSS = Domestic Self-Supply; mgd = million gallons per day; UEC = Upper East Coast.

* Values listed are only for the area within the UEC Planning Area boundary.

Table A-9. DSS gross (raw) water demands under 1-in-10-year drought conditions in the UEC Planning Area.

County DSS	Demand – 1-in-10-Year Drought Conditions (mgd)						
	2019	2020	2025	2030	2035	2040	2045
Martin	1.29	1.31	1.40	1.49	1.56	1.63	1.69
St. Lucie	5.01	5.22	5.10	5.61	4.31	4.40	4.47
Okeechobee*	0.06	0.06	0.07	0.07	0.07	0.07	0.07
UEC Planning Area Total	6.36	6.59	6.57	7.17	5.94	6.10	6.23

DSS = Domestic Self-Supply; mgd = million gallons per day; UEC = Upper East Coast.

* Values listed are only for the area within the UEC Planning Area boundary.

AGRICULTURE

Water demands reported under AG include water used for agricultural production, such as farm irrigation, operation of greenhouses and nurseries, and raising livestock. Water used in the processing of agricultural commodities is accounted for under the CII category.

The 2016 UEC Plan Update relied on various sources to develop agricultural acreage estimates and projections, including agricultural water use permits, parcel-level land use maps, and results from the United States Census of Agriculture. Irrigated acres were translated to water volume estimates (in mgd) using the Agricultural Field-Scale Irrigation Requirements Simulation (AFSIRS) model (Smajstrla 1990).

Florida State legislation passed in 2013 prescribed a new approach for water management districts to consider when developing agricultural water demands for regional water supply plans. Section 570.93, F.S., directs the Florida Department of Agriculture and Consumer Services (FDACS) to develop annual statewide agricultural acreage and water demand projections based on the same 20-year planning horizon used in water supply planning. Under Section 373.709(2)(a), F.S., water management districts are required to consider FDACS projections, and any adjustments or deviations from the projections published by FDACS, "...must be fully described, and the original data must be presented along with the adjusted data."

AG Projection Methodology

FSAID VII Acreage and Demands Data

FDACS publishes 20-year agricultural acreage and associated water demand projections in annual Florida Statewide Agricultural Irrigation Demand (FSAID) reports. The seventh annual report (referred to as FSAID VII) was published in 2020 (FDACS 2020). The FSAID VII acres (**Table A-10**) were used for this 2021 UEC Plan Update to calculate AG demands. For the purposes of this 2021 UEC Plan Update, the 2018 acres in FSAID VII were considered representative of 2019 conditions. The FSAID VII demands, as calculated by FDACS (**Table A-11**), were not used in this plan update, and the deviation from using these projections is described below.

Table A-10. Irrigated agricultural acres in the UEC Planning Area (From: FDACS 2020).

Crop	2018*	2020	2025	2030	2035	2040	2045
Citrus	32,478	32,137	29,377	27,464	24,919	22,351	20,109
Sugarcane	24,081	24,081	23,774	22,673	21,494	20,500	20,359
Fresh Market Vegetables	20,586	19,162	17,758	17,403	17,304	17,167	16,163
Hay/Pasture	20,493	20,475	20,131	19,069	18,413	17,111	15,486
Greenhouse/Nursery	5,394	5,068	4,874	4,649	4,310	4,206	3,753
Sod	2,900	2,448	2,364	2,181	2,057	1,856	1,856
Potatoes	1,101	1,101	1,101	1,101	1,080	1,080	1,080
Fruit (Non-Citrus)	350	350	350	198	198	198	198
Total	107,383	104,822	99,729	94,738	89,775	84,469	79,004

FDACS = Florida Department of Agriculture and Consumer Services; UEC = Upper East Coast.

* 2018 acres are considered representative of 2019 conditions for the purposes of this plan update.

Table A-11. Irrigated agricultural demands (in mgd) in the UEC Planning Area
(From: FDACS 2020).

Crop	2018*	2020	2025	2030	2035	2040	2045
Citrus	28.83	28.33	25.96	24.39	22.28	20.10	18.14
Sugarcane	29.74	29.80	29.56	28.31	26.95	25.83	25.77
Fresh Market Vegetables	28.20	26.33	24.48	24.04	23.94	23.80	22.44
Hay/Pasture	14.34	14.40	14.03	12.98	12.46	11.41	10.20
Greenhouse/Nursery	13.70	12.94	12.54	11.94	11.14	10.87	9.82
Sod	2.63	2.26	2.17	2.00	1.91	1.75	1.74
Potatoes	1.29	1.29	1.30	1.30	1.26	1.26	1.27
Fruit (Non-Citrus)	0.63	0.63	0.64	0.35	0.35	0.35	0.35
Total	119.36	115.98	110.68	105.31	100.29	95.37	89.73

FDACS = Florida Department of Agriculture and Consumer Services; mgd = million gallons per day; UEC = Upper East Coast.

* 2018 acres are considered representative of 2019 conditions for the purposes of this plan update.

Prior to the publication of the FSAID VII report, SFWMD staff identified FSAID VI parcels for removal from irrigated acreage based on visual inspection of historical aerial imagery, recent regulatory water use data, and the location of recently implemented surface water management or environmental restoration projects. All edits were made in coordination with FDACS and integrated into the FSAID VII report. The FSAID VII acreage estimates and projections are used in this 2021 UEC Plan Update; however, water demands were calculated separately by SFWMD staff using the AFSIRS model. AG demands published in the 2016 UEC Plan Update and in other regional water supply plans were developed using the AFSIRS model. Alternative demands developed using FSAID VII acreages and the AFSIRS model were evaluated with the demands published in the FSAID VII report, as described below.

Comparison of FSAID VII and AFSIRS Demands

The estimated 2019 and projected 2045 demands from the AFSIRS model were compared to the demands in the FSAID VII report. Both sets of demands are based on the same irrigated acreages, established in the FSAID VII report. Despite being based on the same unadjusted irrigated footprint, the demand projections differed by 53.39 mgd in 2019 and 39.29 mgd in 2045 (**Figure A-4**).

The SFWMD uses AFSIRS to estimate demands simulated in regional groundwater models, and the demands using AFSIRS resemble those obtained through the SFWMD's permitting methods. After reviewing water demands from FSAID VII and AFSIRS, the SFWMD chose to use water demand estimates and projections from AFSIRS based on irrigated acres published in the FSAID VII report. The decision to deviate from water demands published in the FSAID VII report was made to maintain a consistent approach with previous planning and regional modeling efforts.

Data for soil type, rainfall, reference evapotranspiration, and irrigation method are among the key inputs for AFSIRS to calculate current and future demands. Soil input data were obtained from the Natural Resources Conservation Service's SSURGO database (<https://websoilsurvey.nrcs.usda.gov>). Daily rainfall data were obtained from the SFWMD's Next Generation Radar (NEXRAD) rainfall data set. Reference evapotranspiration data were obtained from the United States Geological Survey's Statewide Evapotranspiration Information and Data database (<http://fl.water.usgs.gov/et/>). The irrigation method for each irrigated parcel used with AFSIRS is part of the FSAID VII data set. Most citrus groves are irrigated via micro-spray. Flood irrigation is the most common method for all other crop categories.

Water demands associated with livestock and aquaculture production complete the demands for the AG category. Demands for these activities were taken directly from the FSAID VII report (FDACS 2020) without adjustment.

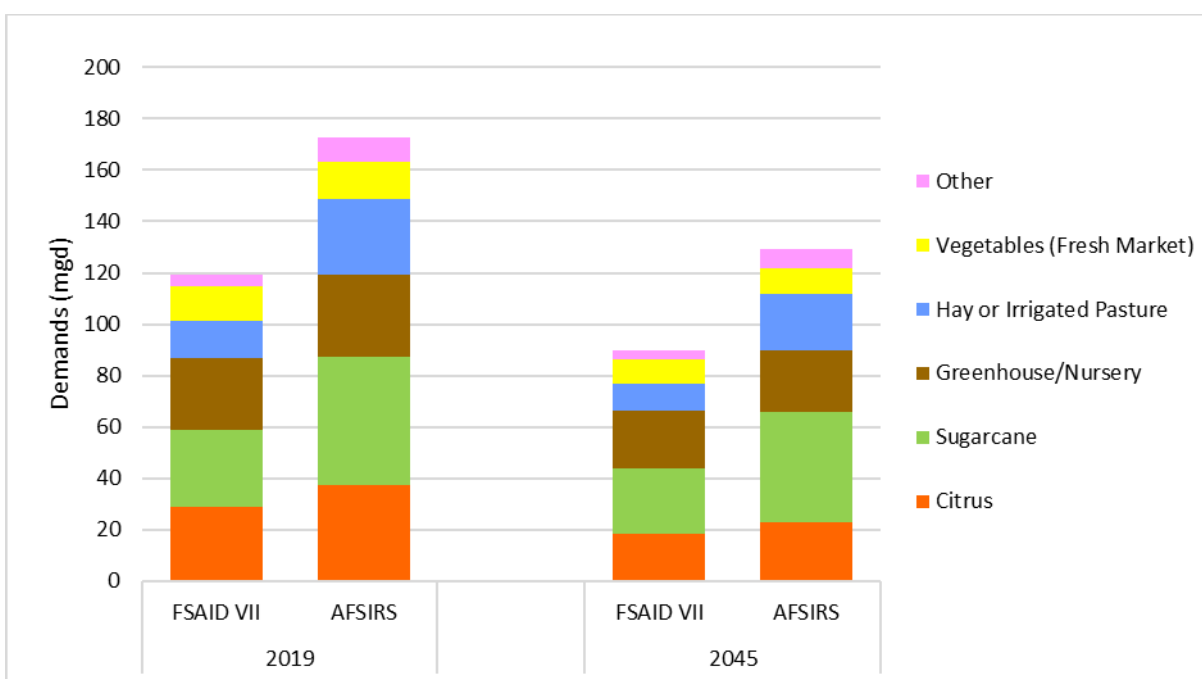


Figure A-4. Comparison of average water demands from the seventh Florida Statewide Agricultural Irrigation Demand (FSAID VII) report and the Agricultural Field-Scale Irrigation Requirements Simulation (AFSIRS). Note: The “Other” category includes commodities combined from **Table A-11** that are not graphed individually.

AG Projection Results

AG acres and water demands depend on the choices of individual agricultural producers from year to year. Those choices are affected by several factors, including weather, markets, disease, proprietary information, and urban development pressure. AG projections can be affected by population changes as well as future land use conversions.

The gross irrigation requirements for various crop types under the AG category are provided in **Tables A-12 to A-19**. **Tables A-20 and A-21** summarize the gross water requirements for livestock and aquaculture.

Citrus

Table A-12 presents the citrus acreage and gross irrigation requirement (water withdrawal demand) projections under average rainfall and 1-in-10-year drought conditions.

Table A-12. Gross irrigation demands (in mgd) for citrus acreage in the UEC Planning Area.

	2019	2020	2025	2030	2035	2040	2045
Martin County							
Irrigated acres	3,260	3,260	3,260	3,175	3,175	3,175	2,563
Average rainfall	3.61	3.61	3.61	3.54	3.54	3.54	2.72
1-in-10-year drought	4.59	4.59	4.59	4.49	4.49	4.49	3.48
St. Lucie County							
Irrigated acres	27,033	26,692	23,932	22,104	19,559	16,992	15,361
Average rainfall	31.22	30.78	27.65	25.53	22.10	19.34	17.61
1-in-10-year drought	39.39	38.84	34.89	32.22	27.89	24.41	22.47
Okeechobee County*							
Irrigated acres	2,185	2,185	2,185	2,185	2,185	2,185	2,185
Average rainfall	2.37	2.37	2.37	2.37	2.37	2.37	2.37
1-in-10-year drought	2.94	2.94	2.94	2.94	2.94	2.94	2.94
UEC Planning Area							
Irrigated acres	32,478	32,137	29,377	27,464	24,919	22,351	20,109
Average rainfall	37.20	36.76	33.63	31.44	28.01	25.25	22.70
1-in-10-year drought	46.92	46.37	42.42	39.65	35.32	31.84	28.89

mgd = million gallons per day; UEC = Upper East Coast.

* Values listed are only for the area within the UEC Planning Area boundary.



Citrus Grove

Sugarcane

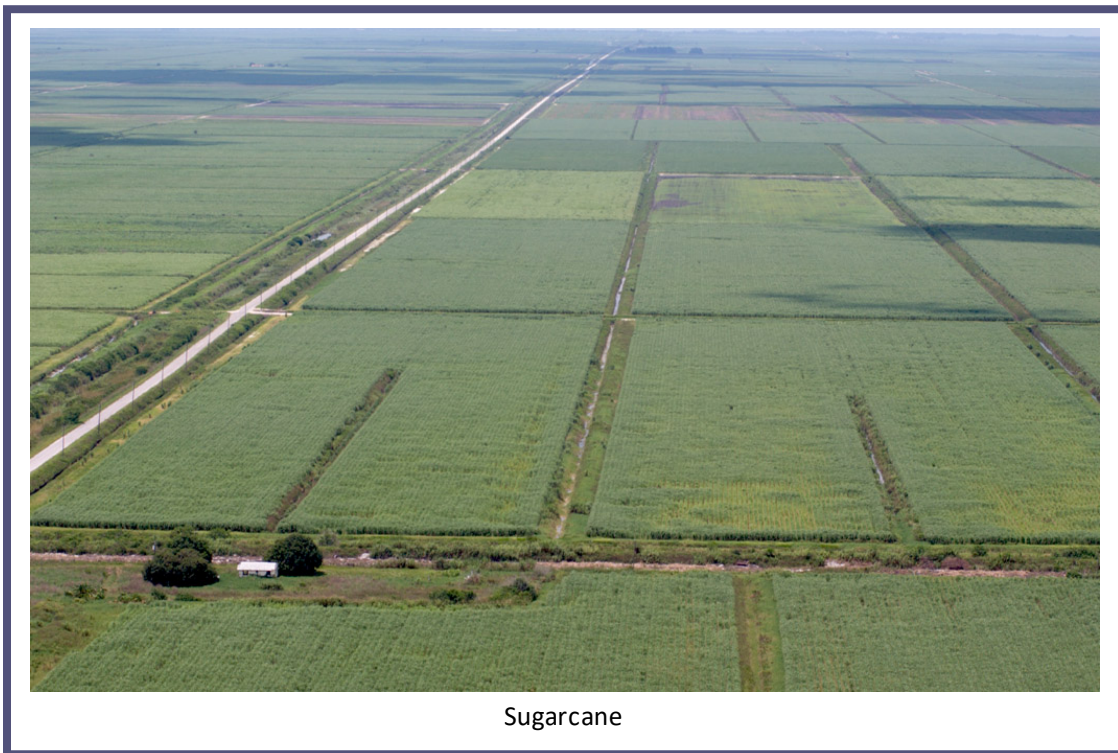
Table A-13 presents the sugarcane acreage and gross irrigation requirement (water withdrawal demand) projections under average rainfall and 1-in-10-year drought conditions.

Table A-13. Gross irrigation demands (in mgd) for sugarcane acreage in the UEC Planning Area.

	2019	2020	2025	2030	2035	2040	2045
Martin County							
Irrigated acres	24,081	24,081	23,774	22,673	21,494	20,500	20,359
Average rainfall	50.03	50.03	49.41	47.19	45.09	42.97	42.66
1-in-10-year drought	58.11	58.11	57.38	54.80	52.78	50.30	49.94
St. Lucie County							
Irrigated acres	0	0	0	0	0	0	0
Average rainfall	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1-in-10-year drought	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Okeechobee County*							
Irrigated acres	0	0	0	0	0	0	0
Average rainfall	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1-in-10-year drought	0.00	0.00	0.00	0.00	0.00	0.00	0.00
UEC Planning Area							
Irrigated acres	24,081	24,081	23,774	22,673	21,494	20,500	20,359
Average rainfall	50.03	50.03	49.41	47.19	45.09	42.97	42.66
1-in-10-year drought	58.11	58.11	57.38	54.80	52.78	50.30	49.94

mgd = million gallons per day; UEC = Upper East Coast.

* Values listed are only for the area within the UEC Planning Area boundary.



Fresh Market Vegetables

Table A-14 presents the fresh market vegetable acreage and gross irrigation requirement (water withdrawal demand) projections under average rainfall and 1-in-10-year drought conditions, assuming two plantings per year, lasting 4 months each.

Table A-14. Gross irrigation demands (in mgd) for fresh market vegetable acreage in the UEC Planning Area.

	2019	2020	2025	2030	2035	2040	2045
Martin County							
Irrigated acres	9,992	9,435	8,245	8,208	8,208	8,170	7,636
Average rainfall	19.84	18.77	16.76	16.66	16.66	16.56	15.46
1-in-10-year drought	22.76	21.54	19.23	19.12	19.12	19.00	17.67
St. Lucie County							
Irrigated acres	10,524	9,656	9,444	9,124	9,025	8,927	8,457
Average rainfall	11.84	10.51	10.17	9.41	9.20	9.01	7.99
1-in-10-year drought	15.24	13.52	13.09	12.11	11.84	11.59	10.61
Okeechobee County*							
Irrigated acres	70	70	70	70	70	70	70
Average rainfall	0.18	0.18	0.18	0.18	0.18	0.18	0.18
1-in-10-year drought	0.21	0.21	0.21	0.21	0.21	0.21	0.21
UEC Planning Area							
Irrigated acres	20,586	19,162	17,758	17,403	17,304	17,167	16,163
Average rainfall	31.86	29.46	27.11	26.25	26.04	25.75	23.63
1-in-10-year drought	38.21	35.27	32.53	31.44	31.17	30.80	28.49

mgd = million gallons per day; UEC = Upper East Coast.

* Values listed are only for the area within the UEC Planning Area boundary.



Tomato Harvest

Hay/Irrigated Pasture

Table A-15 presents the hay/pasture acreage and gross irrigation requirement (water withdrawal demand) projections under average rainfall and 1-in-10-year drought conditions. The FSAID acres for this category are labeled and modeled as hay. The associated demands calculated with AFSIRS are assumed to capture irrigation for hay and any irrigation used for improved pasture.

Table A-15. Gross irrigation demands (in mgd) for hay/pasture acreage in the UEC Planning Area.

	2019	2020	2025	2030	2035	2040	2045
Martin County							
Irrigated acres	9,167	9,167	9,167	8,883	8,752	8,060	7,815
Average rainfall	13.78	13.78	13.78	13.36	13.15	12.11	11.64
1-in-10-year drought	15.86	15.86	15.86	15.37	15.13	13.94	13.37
St. Lucie County							
Irrigated acres	10,123	10,104	9,760	8,983	8,458	7,848	6,468
Average rainfall	14.84	14.83	14.32	13.17	12.42	11.42	9.47
1-in-10-year drought	17.33	17.31	16.72	15.39	14.51	13.33	11.02
Okeechobee County*							
Irrigated acres	1,203	1,203	1,203	1,203	1,203	1,203	1,203
Average rainfall	0.92	0.92	0.92	0.92	0.92	0.92	0.92
1-in-10-year drought	1.14	1.14	1.14	1.14	1.14	1.14	1.14
UEC Planning Area							
Irrigated acres	20,493	20,475	20,131	19,069	18,413	17,111	15,486
Average rainfall	29.54	29.53	29.02	27.45	26.49	24.45	22.03
1-in-10-year drought	34.33	34.31	33.72	31.90	30.78	28.41	25.53

mgd = million gallons per day; UEC = Upper East Coast.

* Values listed are only for the area within the UEC Planning Area boundary.

Greenhouse/Nursery

Table A-16 presents the greenhouse/nursery acreage and gross irrigation requirement (water withdrawal demand) projections under average rainfall and 1-in-10-year drought conditions.

Table A-16. Gross irrigation demands (in mgd) for greenhouse/nursery acreage in the UEC Planning Area.

	2019	2020	2025	2030	2035	2040	2045
Martin County							
Irrigated acres	3,310	3,209	3,136	3,044	2,844	2,792	2,373
Average rainfall	7.76	7.23	6.84	6.57	6.29	6.21	5.55
1-in-10-year drought	8.64	8.05	7.62	7.32	7.01	6.92	6.21
St. Lucie County							
Irrigated acres	2,009	1,784	1,664	1,530	1,392	1,340	1,305
Average rainfall	6.52	5.67	5.35	4.95	4.30	4.09	3.94
1-in-10-year drought	7.10	6.18	5.82	5.39	4.68	4.45	4.31
Okeechobee County*							
Irrigated acres	74	74	74	74	74	74	74
Average rainfall	0.46	0.46	0.46	0.46	0.46	0.46	0.46
1-in-10-year drought	0.51	0.51	0.51	0.51	0.51	0.51	0.51
UEC Planning Area							
Irrigated acres	5,394	5,068	4,874	4,649	4,310	4,206	3,753
Average rainfall	14.74	13.36	12.65	11.98	11.05	10.76	9.95
1-in-10-year drought	16.25	14.74	13.95	13.22	12.20	11.88	11.03

mgd = million gallons per day; UEC = Upper East Coast.

* Values listed are only for the area within the UEC Planning Area boundary.

Sod

Table A-17 presents the sod acreage and gross irrigation requirement (water withdrawal demand) projections under average rainfall and 1-in-10-year drought conditions.

Table A-17. Gross irrigation demands (in mgd) for sod acreage in the UEC Planning Area.

	2019	2020	2025	2030	2035	2040	2045
Martin County							
Irrigated acres	1,858	1,406	1,406	1,406	1,282	1,216	1,216
Average rainfall	3.12	2.61	2.61	2.61	2.38	2.22	2.22
1-in-10-year drought	3.76	3.14	3.14	3.14	3.03	2.82	2.82
St. Lucie County							
Irrigated acres	865	865	781	728	728	594	594
Average rainfall	1.95	1.95	1.74	1.67	1.67	1.40	1.40
1-in-10-year drought	2.29	2.29	2.05	1.97	1.97	1.61	1.61
Okeechobee County*							
Irrigated acres	177	177	177	47	47	47	47
Average rainfall	0.49	0.49	0.49	0.09	0.09	0.09	0.09
1-in-10-year drought	0.58	0.58	0.58	0.10	0.10	0.10	0.10
UEC Planning Area							
Irrigated acres	2,900	2,448	2,364	2,181	2,057	1,856	1,856
Average rainfall	5.56	5.05	4.84	4.37	4.14	3.71	3.71
1-in-10-year drought	6.63	6.01	5.77	5.21	5.10	4.53	4.53

mgd = million gallons per day; UEC = Upper East Coast.

* Values listed are only for the area within the UEC Planning Area boundary.



Sod Farm

Potatoes

Table A-18 presents the potato acreage and gross irrigation requirement (water withdrawal demand) projections under average rainfall and 1-in-10-year drought conditions.

Table A-18. Gross irrigation demands (in mgd) for potato acreage in the UEC Planning Area.

	2019	2020	2025	2030	2035	2040	2045
Martin County							
Irrigated acres	1,101	1,101	1,101	1,101	1,080	1,080	1,080
Average rainfall	3.10	3.10	3.10	3.10	3.04	3.04	3.04
1-in-10-year drought	3.60	3.60	3.60	3.60	3.53	3.53	3.53
St. Lucie County							
Irrigated acres	0	0	0	0	0	0	0
Average rainfall	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1-in-10-year drought	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Okeechobee County*							
Irrigated acres	0	0	0	0	0	0	0
Average rainfall	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1-in-10-year drought	0.00	0.00	0.00	0.00	0.00	0.00	0.00
UEC Planning Area							
Irrigated acres	1,101	1,101	1,101	1,101	1,080	1,080	1,080
Average rainfall	3.10	3.10	3.10	3.10	3.04	3.04	3.04
1-in-10-year drought	3.60	3.60	3.60	3.60	3.53	3.53	3.53

mgd = million gallons per day; UEC = Upper East Coast.

* Values listed are only for the area within the UEC Planning Area boundary.

Fruit (Non-Citrus)

Table A-19 presents the fruit (non-citrus) acreage and gross irrigation requirement (water withdrawal demand) projections under average rainfall and 1-in-10-year drought conditions.

Table A-19. Gross irrigation demands (in mgd) for fruit (non-citrus) acreage in the UEC Planning Area.

	2019	2020	2025	2030	2035	2040	2045
Martin County							
Irrigated acres	10	10	10	10	10	10	10
Average rainfall	0.01	0.01	0.01	0.01	0.01	0.01	0.01
1-in-10-year drought	0.02	0.02	0.02	0.02	0.02	0.02	0.02
St. Lucie County							
Irrigated acres	340	340	340	187	187	187	187
Average rainfall	0.70	0.70	0.70	0.39	0.39	0.39	0.39
1-in-10-year drought	0.80	0.80	0.80	0.45	0.45	0.45	0.45
Okeechobee County*							
Irrigated acres	0	0	0	0	0	0	0
Average rainfall	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1-in-10-year drought	0.00	0.00	0.00	0.00	0.00	0.00	0.00
UEC Planning Area							
Irrigated acres	350	350	350	198	198	198	198
Average rainfall	0.71	0.71	0.71	0.40	0.40	0.40	0.40
1-in-10-year drought	0.82	0.82	0.82	0.47	0.47	0.47	0.47

mgd = million gallons per day; UEC = Upper East Coast.

* Values listed are only for the area within the UEC Planning Area boundary.

Livestock

Table A-20 presents the FSAID VII water demand projections for livestock. Livestock demands published in the FSAID VII report were developed with assumed water requirements per head of livestock. Livestock demands were assumed to be the same under average rainfall and 1-in-10-year drought conditions.

Table A-20. Gross water demands (in mgd) for livestock in the UEC Planning Area.

2019	2020	2025	2030	2035	2040	2045
Martin County						
0.38	0.38	0.38	0.38	0.38	0.38	0.38
St. Lucie County						
0.47	0.47	0.47	0.47	0.47	0.47	0.47
Okeechobee County*						
1.06	1.06	1.06	1.06	1.06	1.06	1.06
UEC Planning Area						
1.91	1.91	1.91	1.91	1.91	1.91	1.91

mgd = million gallons per day; UEC = Upper East Coast.

* Values listed are only for the area within the UEC Planning Area boundary.

Note: Water demands for livestock were obtained from the seventh Florida Statewide Agricultural Irrigation Demand (FSAID VII) report, not calculated using the Agricultural Field-Scale Irrigation Requirements Simulation (AFSIRS) model.

Aquaculture

Table A-21 presents the FSAID VII water demand projections for aquaculture. Aquaculture demands were assumed to be the same under average rainfall and 1-in-10-year drought conditions.

Table A-21. Gross water demands (in mgd) for aquaculture in the UEC Planning Area.

2019	2020	2025	2030	2035	2040	2045
Martin County						
0.04	0.04	0.04	0.04	0.04	0.04	0.04
St. Lucie County						
0.02	0.02	0.02	0.02	0.02	0.02	0.02
Okeechobee County*						
0.01	0.01	0.01	0.01	0.01	0.01	0.01
UEC Planning Area						
0.07	0.07	0.07	0.07	0.07	0.07	0.07

mgd = million gallons per day; UEC = Upper East Coast.

* Values listed are only for the area within the UEC Planning Area boundary.

Note: Water demands for aquaculture were obtained from the seventh Florida Statewide Agricultural Irrigation Demand (FSAID VII) report, not calculated using the Agricultural Field-Scale Irrigation Requirements Simulation (AFSIRS) model.

Summary of Agricultural Results

Irrigated agricultural acres are projected to decrease 26% over the planning horizon, from 107,383 to 79,004 acres (**Tables A-22** and **A-23**). All counties are projected to experience reductions in demands, though Martin County will continue to have the majority of irrigated acres and AG demands through 2045 (**Table A-23**). AG demands across the UEC Planning Area are projected to decrease approximately 26%, from 174.72 mgd in 2019 to 130.10 mgd 2045 under average rainfall conditions. Sugarcane accounts for the largest share of AG demands: 50.03 mgd in 2019 and 42.66 mgd in 2045. Although citrus has the greatest number of irrigated acres in 2019, the crop is projected to have the greatest decrease in irrigated acreage and associated demands over the planning horizon. By 2045, citrus will be reduced to 20,109 acres and its demands will be 22.70 mgd.

Table A-22. Summary of gross water demands (in mgd) for all agricultural acreage, livestock, and aquaculture in the UEC Planning Area, by commodity.

	2019	2020	2025	2030	2035	2040	2045
Citrus							
Irrigated acres	32,478	32,137	29,377	27,464	24,919	22,351	20,109
Average rainfall	37.20	36.76	33.63	31.44	28.01	25.25	22.70
1-in-10-year drought	46.92	46.37	42.42	39.65	35.32	31.84	28.89
Sugarcane							
Irrigated acres	24,081	24,081	23,774	22,673	21,494	20,500	20,359
Average rainfall	50.03	50.03	49.41	47.19	45.09	42.97	42.66
1-in-10-year drought	58.11	58.11	57.38	54.80	52.78	50.30	49.94
Fresh Market Vegetables							
Irrigated acres	20,586	19,162	17,758	17,403	17,304	17,167	16,163
Average rainfall	31.86	29.46	27.11	26.25	26.04	25.75	23.63
1-in-10-year drought	38.21	35.27	32.53	31.44	31.17	30.80	28.49
Hay/Irrigated Pasture							
Irrigated acres	20,493	20,475	20,131	19,069	18,413	17,111	15,486
Average rainfall	29.54	29.53	29.02	27.45	26.49	24.45	22.03
1-in-10-year drought	34.33	34.31	33.72	31.90	30.78	28.41	25.53
Greenhouse/Nursery							
Irrigated acres	5,394	5,068	4,874	4,649	4,310	4,206	3,753
Average rainfall	14.74	13.36	12.65	11.98	11.05	10.76	9.95
1-in-10-year drought	16.25	14.74	13.95	13.22	12.20	11.88	11.03
Sod							
Irrigated acres	2,900	2,448	2,364	2,181	2,057	1,856	1,856
Average rainfall	5.56	5.05	4.84	4.37	4.14	3.71	3.71
1-in-10-year drought	6.63	6.01	5.77	5.21	5.10	4.53	4.53
Potatoes							
Irrigated acres	1,101	1,101	1,101	1,101	1,080	1,080	1,080
Average rainfall	3.10	3.10	3.10	3.10	3.04	3.04	3.04
1-in-10-year drought	3.60	3.60	3.60	3.60	3.53	3.53	3.53
Fruit (Non-Citrus)							
Irrigated acres	350	350	350	198	198	198	198
Average rainfall	0.71	0.71	0.71	0.40	0.40	0.40	0.40
1-in-10-year drought	0.82	0.82	0.82	0.47	0.47	0.47	0.47
Livestock							
Irrigated acres	--	--	--	--	--	--	--
Average rainfall	1.91	1.91	1.91	1.91	1.91	1.91	1.91
1-in-10-year drought	1.91	1.91	1.91	1.91	1.91	1.91	1.91
Aquaculture							
Irrigated acres	--	--	--	--	--	--	--
Average rainfall	0.07	0.07	0.07	0.07	0.07	0.07	0.07
1-in-10-year drought	0.07	0.07	0.07	0.07	0.07	0.07	0.07
UEC Planning Area							
Irrigated acres	107,383	104,820	99,729	94,737	89,774	84,470	79,004
Average rainfall	174.72	169.98	162.45	154.16	146.24	138.31	130.10
1-in-10-year drought	206.85	201.21	192.17	182.27	171.33	163.74	154.39

mgd = million gallons per day; UEC = Upper East Coast.

Table A-23. Summary of gross water demands (in mgd) for all agricultural acreage, livestock, and aquaculture in the UEC Planning Area, by county.

	2019	2020	2025	2030	2035	2040	2045
Martin County							
Irrigated acres	52,780	51,670	50,099	48,500	46,845	45,003	43,054
Average rainfall	101.67	99.56	96.54	93.46	90.58	87.08	83.72
1-in-10-year drought	117.76	115.33	111.86	108.28	105.53	101.44	97.46
St. Lucie County							
Irrigated acres	50,894	49,441	45,921	42,658	39,350	35,888	32,371
Average rainfall	67.56	64.93	60.42	55.61	50.57	46.14	41.29
1-in-10-year drought	82.64	79.43	73.86	68.02	61.83	56.33	50.96
Okeechobee County*							
Irrigated acres	3,709	3,709	3,709	3,579	3,579	3,579	3,579
Average rainfall	5.49	5.49	5.49	5.09	5.09	5.09	5.09
1-in-10-year drought	6.45	6.45	6.45	5.97	5.97	5.97	5.97
UEC Planning Area							
Irrigated acres	107,383	104,820	99,729	94,737	89,774	84,470	79,004
Average rainfall	174.72	169.98	162.45	154.16	146.24	138.31	130.10
1-in-10-year drought	206.85	201.21	192.17	182.27	173.33	163.74	154.39

mgd = million gallons per day; UEC = Upper East Coast.

* Values listed are only for the area within the UEC Planning Area boundary.

COMMERCIAL/INDUSTRIAL/INSTITUTIONAL

The CII water use category includes water demands associated with industrial and commercial operations for processing, manufacturing, and technical needs such as concrete, citrus processing, and mining operations. Industrial or commercial users that receive water from PS utilities or use recirculated water in closed-loop geothermal heating and cooling systems are not included in CII demand calculations. Although a large portion of CII water used by the mining industry for activities such as rock washing is returned to the source, all mining water use is included in demand estimates and projections. All CII demand estimates and projections are presumed to be the same for average rainfall and 1-in-10-year drought conditions.

CII Projection Methodology

CII estimates and projections are based on water use data from the SFWMD's regulatory database. If an active CII permit holder did not report water use, demand estimates were calculated as described in the *2019 Estimated Water Use Report* (SFWMD 2020).

Increases in the CII category are expected to be driven by growth of the regional economy and permanent resident population. Therefore, CII projections are anticipated to increase steadily as county permanent resident populations increase. Previous analyses of the relationship between CII demands and population growth support this approach.

CII Projection Results

Table A-24 summarizes the current and projected CII demands in the UEC Planning Area in 5-year increments through 2045. Martin County maintains a dominant share of the region's CII demands over the planning horizon.

Table A-24. CII demand projections in the UEC Planning Area.

County	Demand (mgd)						
	2019	2020	2025	2030	2035	2040	2045
Martin	3.46	3.50	3.70	3.86	3.99	4.11	4.21
St. Lucie	0.92	0.97	1.08	1.19	1.29	1.38	1.47
Okeechobee*	0.05	0.05	0.05	0.05	0.05	0.06	0.06
UEC Planning Area Total	4.43	4.52	4.83	5.10	5.33	5.55	5.74

CII = Industrial/Commercial/Institutional; mgd = million gallons per day; UEC = Upper East Coast.

* Values listed are only for the area within the UEC Planning Area boundary.

LANDSCAPE/RECREATIONAL

L/R water demands include irrigation for golf courses and other landscaped areas such as parks, sports fields, and common areas of residential developments. Demands were calculated using a combination of water use reported to the SFWMD as part of its regulatory compliance program and reclaimed water use reported by wastewater utilities to the FDEP. Therefore, demands under the L/R category include areas that are permitted by the SFWMD and areas that are not permitted but rely on reclaimed sources.

There are two types of irrigated landscaped areas outside those permitted by the SFWMD that are excluded from the L/R demands. The first type includes landscaped areas irrigated with potable water provided PS utilities. These demands are accounted for in PS estimates and projections. The second type is irrigated landscaped areas served by individual residential wells permitted by rule (Rule 40E-2.061, Florida Administrative Code) rather than with an individual water use permit. Demands associated with small residential wells are not quantified as part of this 2021 UEC Plan Update due to a lack of water use and acreage data.

L/R Projection Methodology

L/R 2019 water use data reported to the SFWMD and estimated data for those not required to report are available in the *2019 Estimated Water Use Report* (SFWMD 2020). The FDEP's (2019) Reuse Inventory Database provides reclaimed water use data for 2019. The 2019 use data from both sources were considered representative of demands under average rainfall conditions.

Both the SFWMD's reported water use and the FDEP's Reuse Inventory Database allow for the disaggregation of L/R demands into the landscape and golf irrigation subcategories. Irrigated landscape and golf course acres were calculated using the permitted L/R acreage from the SFWMD's regulatory database (**Table A-25**). The distinction is made between L/R demands for golf courses and other landscaped areas because they are projected to grow at different rates. Golf course acreage and associated water demands are projected to remain steady through 2045. Landscape irrigation was assumed to increase at the same rate as the counties' permanent resident populations. This approach is used in other planning areas within the SFWMD and by other water management districts in Florida.

Table A-25. L/R permitted acres in the UEC Planning Area.

Land Use	2019	2020	2025	2030	2035	2040	2045
Martin County							
Landscape	3,716	3,763	3,971	4,145	4,285	4,410	4,522
Golf	3,187	3,187	3,187	3,187	3,187	3,187	3,187
Martin County Total	6,903	6,950	7,158	7,332	7,472	7,597	7,709
St. Lucie County							
Landscape	6,115	6,474	7,207	7,940	8,581	9,178	9,741
Golf	2,219	2,219	2,219	2,219	2,219	2,219	2,219
St. Lucie County Total	8,334	8,693	9,426	10,159	10,800	11,397	11,960
Okeechobee County*							
Landscape	50	50	52	53	54	55	56
Golf	--	--	--	--	--	--	--
Okeechobee County Total	50	50	52	53	54	55	56
UEC Planning Area							
Landscape	9,881	10,287	11,230	12,138	12,920	13,642	14,319
Golf	5,406	5,406	5,406	5,406	5,406	5,406	5,406
UEC Planning Area Total	15,287	15,693	16,636	17,544	18,326	19,048	19,725

L/R = Landscape/Recreational; UEC = Upper East Coast.

* Values listed are only for the area within the UEC Planning Area boundary.

L/R Projection Results

L/R gross irrigation demand projections under average rainfall conditions are presented in **Table A-26**. **Table A-27** shows the additional quantity of water provided to meet projected demands during 1-in-10-year drought conditions.

Table A-26. L/R gross irrigation demands under average rainfall conditions in the UEC Planning Area.

Land Use	Demand – Average Rainfall Conditions (mgd)						
	2019	2020	2025	2030	2035	2040	2045
Martin County							
Landscape	8.38	8.49	8.96	9.35	9.67	9.95	10.20
Golf	7.16	7.16	7.16	7.16	7.16	7.16	7.16
Martin County Total	15.54	15.65	16.12	16.51	16.83	17.11	17.36
St. Lucie County							
Landscape	11.43	12.10	13.47	14.84	16.04	17.16	18.21
Golf	5.00	5.00	5.00	5.00	5.00	5.00	5.00
St. Lucie County Total	16.43	17.10	18.47	19.84	21.04	22.16	23.21
Okeechobee County*							
Landscape	0.06	0.06	0.06	0.06	0.06	0.07	0.07
Golf	--	--	--	--	--	--	--
Okeechobee County Total	0.06	0.06	0.06	0.06	0.06	0.07	0.07
UEC Planning Area							
Landscape	19.87	20.65	22.49	24.25	25.77	27.18	28.48
Golf	12.16	12.16	12.16	12.16	12.16	12.16	12.16
UEC Planning Area Total	32.03	32.81	34.65	36.41	37.93	39.34	40.64

L/R = Landscape/Recreational; mgd = million gallons per day; UEC = Upper East Coast.

* Values listed are only for the area within the UEC Planning Area boundary.

Table A-27. L/R gross irrigation demands under 1-in-10-year drought conditions in the UEC Planning Area.

Land Use	Demand – 1-in-10-Year Drought Conditions (mgd)						
	2019	2020	2025	2030	2035	2040	2045
Martin County							
Landscape	10.56	10.69	11.29	11.78	12.18	12.53	12.85
Golf	9.31	9.31	9.31	9.31	9.31	9.31	9.31
Martin County Total	19.87	20.00	20.60	21.09	21.49	21.84	22.16
St. Lucie County							
Landscape	14.40	15.25	16.98	18.70	20.21	21.62	22.95
Golf	6.50	6.50	6.50	6.50	6.50	6.50	6.50
St. Lucie County Total	20.90	21.75	23.48	25.20	26.71	28.12	29.45
Okeechobee County*							
Landscape	0.07	0.08	0.08	0.08	0.08	0.08	0.08
Golf	--	--	--	--	--	--	--
Okeechobee County Total	0.07	0.08	0.08	0.08	0.08	0.08	0.08
UEC Planning Area							
Landscape	25.03	26.02	28.35	30.56	32.47	34.23	35.88
Golf	15.81	15.81	15.81	15.81	15.81	15.81	15.81
UEC Planning Area Total	40.84	41.83	44.16	46.37	48.28	50.04	51.69

L/R = Landscape/Recreational; mgd = million gallons per day; UEC = Upper East Coast.

* Values listed are only for the area within the UEC Planning Area boundary.

POWER GENERATION

Demands under the PG category include use of groundwater, fresh surface water, or reclaimed water by thermoelectric power generation facilities. There are two power generation plants currently operating in the UEC Planning Area that are addressed in this plan update: Florida Power & Light (FPL) Martin Plant near Indiantown (Martin County) and the Treasure Coast Energy Center in Fort Pierce (St. Lucie County). The FPL Martin Plant draws surface water from the C-44 Canal and an on-site pond for cooling purposes. The Treasure Coast Energy Center withdraws groundwater from the Floridan aquifer system. No PG facilities used reclaimed water in 2019.

PG demands for 2019 and 2020 were based on reported pumpage and determined through coordination with power generation facility staff. Future demands beyond 2020 were projected by FPL based on past and current pumpage. No new power generation facilities are planned for construction or operation through 2045, and PG demands are projected to remain relatively stable (**Table A-28**). All PG demand estimates and projections are presumed to be the same for average rainfall and 1-in-10-year drought conditions.

Table A-28. Average gross water demand for PG in the UEC Planning Area between 2019 and 2045.

County	Demand (mgd)						
	2019	2020	2025	2030	2035	2040	2045
Martin	16.46	14.13	14.13	14.13	14.13	14.13	14.13
St. Lucie	1.45	3.34	3.34	3.34	3.34	3.34	3.34
UEC Planning Area Total	17.91	17.47	17.47	17.47	17.47	17.47	17.47

mgd = million gallons per day; PG = Power Generation; UEC = Upper East Coast.

SUMMARY OF DEMAND PROJECTIONS

Total demands for the UEC Planning Area are anticipated to decrease by 9.93 mgd (3%). AG demands are projected to see the largest decrease from 2019 to 2045, falling from 174.72 mgd to 130.10 mgd (-26%). PS is expected to increase 45% due to the projected population growth of 219,643 permanent residents, reaching 81.62 mgd by 2045. Also driven by population growth, L/R demands are projected to reach 40.64 mgd by 2045. The demands for all remaining categories (DSS, CII, and PG) are small and projected to be 28.82 mgd, combined, in 2045. Gross water demands in 5-year increments, by county and water use category, are provided in **Table A-29** for average rainfall conditions and **Table A-30** for 1-in-10-year drought conditions.

Table A-29. Summary of gross water demands under average rainfall conditions in the UEC Planning Area, by water use category.

Water Use Category	Demand – Average Rainfall Conditions (mgd)						
	2019	2020	2025	2030	2035	2040	2045
Martin County							
Public Supply	22.26	22.54	23.89	25.00	25.92	26.61	27.23
Domestic Self-Supply	1.11	1.12	1.20	1.27	1.34	1.39	1.45
Agriculture	101.67	99.56	96.54	93.46	90.58	87.08	83.72
Commercial/Industrial/Institutional	3.46	3.50	3.70	3.86	3.99	4.11	4.21
Landscape/Recreational	15.54	15.65	16.12	16.51	16.83	17.11	17.36
Power Generation	16.46	14.13	14.13	14.13	14.13	14.13	14.13
Martin County Total	160.50	156.50	155.58	154.23	152.79	150.43	148.10
St. Lucie County							
Public Supply	34.00	35.98	40.18	43.22	47.82	51.20	54.39
Domestic Self-Supply	4.60	4.79	4.97	5.15	3.96	4.03	4.10
Agriculture	67.56	64.93	60.42	55.61	50.57	46.14	41.29
Commercial/Industrial/Institutional	0.92	0.97	1.08	1.19	1.29	1.38	1.47
Landscape/Recreational	16.43	17.10	18.47	19.84	21.04	22.16	23.21
Power Generation	1.45	3.34	3.34	3.34	3.34	3.34	3.34
St. Lucie County Total	124.96	127.11	128.46	128.35	128.02	128.25	127.80
Okeechobee County*							
Public Supply	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Domestic Self-Supply	0.05	0.05	0.06	0.06	0.06	0.06	0.06
Agriculture	5.49	5.49	5.49	5.09	5.09	5.09	5.09
Commercial/Industrial/Institutional	0.05	0.05	0.05	0.05	0.05	0.06	0.06
Landscape/Recreational	0.06	0.06	0.06	0.06	0.06	0.07	0.07
Power Generation	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Okeechobee County Total	5.65	5.65	5.66	5.26	5.26	5.28	5.28
UEC Planning Area							
UEC Planning Area Total	291.11	289.26	289.70	287.84	286.07	283.96	281.18

mgd = million gallons per day; UEC = Upper East Coast.

* Values listed are only for the area within the UEC Planning Area boundary.

Table A-30. Summary of gross water demands under 1-in-10-year drought conditions in the UEC Planning Area, by water use category.

Water Use Category	Demand – 1-in-10-Year Drought Conditions (mgd)						
	2019	2020	2025	2030	2035	2040	2045
Martin County							
Public Supply	25.97	26.30	27.88	29.17	30.24	31.04	31.76
Domestic Self-Supply	1.29	1.31	1.40	1.49	1.56	1.63	1.69
Agriculture	117.76	115.33	111.86	108.28	105.53	101.44	97.46
Commercial/Industrial/Institutional	3.46	3.50	3.70	3.86	3.99	4.11	4.21
Landscape/Recreational	19.87	20.00	20.60	21.09	21.49	21.84	22.16
Power Generation	16.46	14.13	14.13	14.13	14.13	14.13	14.13
Martin County Total	184.81	180.57	179.57	178.02	176.94	174.19	171.41
St. Lucie County							
Public Supply	37.07	39.23	42.79	47.11	52.12	55.80	59.29
Domestic Self-Supply	5.01	5.22	5.10	5.61	4.31	4.40	4.47
Agriculture	82.64	79.43	73.86	68.02	61.83	56.33	50.96
Commercial/Industrial/Institutional	0.92	0.97	1.08	1.19	1.29	1.38	1.47
Landscape/Recreational	20.90	21.75	23.48	25.20	26.71	28.12	29.45
Power Generation	1.45	3.34	3.34	3.34	3.34	3.34	3.34
St. Lucie County Total	147.99	149.94	149.65	150.47	149.60	149.37	148.98
Okeechobee County*							
Public Supply	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Domestic Self-Supply	0.06	0.06	0.07	0.07	0.07	0.07	0.07
Agriculture	6.45	6.45	6.45	5.97	5.97	5.97	5.97
Commercial/Industrial/Institutional	0.05	0.05	0.05	0.05	0.05	0.06	0.06
Landscape/Recreational	0.07	0.08	0.08	0.08	0.08	0.08	0.08
Power Generation	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Okeechobee County Total	6.63	6.64	6.65	6.17	6.17	6.18	6.18
UEC Planning Area							
UEC Planning Area Total	339.43	337.15	335.87	334.66	332.71	329.74	326.57

mgd = million gallons per day; UEC = Upper East Coast.

* Values listed are only for the area within the UEC Planning Area boundary.

REFERENCES

- FDACS. 2020. *Florida Statewide Agricultural Irrigation Demand Estimated Agricultural Water Demand, 2018-2045*. Prepared by The Balmoral Group, Winter Park, FL, for the Florida Department of Agriculture and Consumer Services, Tallahassee, FL. June 30, 2020.
- FDEP. 2019. *Reuse Inventory Database*. Available at:
<http://www.dep.state.fl.us/water/reuse/inventory.htm>.
- Rayer, S. and Y. Wang. 2020. *Projections of Florida Population by County, 2020-2045, with Estimates for 2019*. Florida Population Studies Bulletin 186. University of Florida, Bureau of Economic and Business Research.
- SFWMD. 1998. *1998 Districtwide Water Supply Assessment*. South Florida Water Management District, West Palm Beach, FL.
- SFWMD. 2020. *South Florida Water Management District 2019 Estimated Water Use Report*. South Florida Water Management District, West Palm Beach, FL.
- Smajstrla, A.G. 1990. *Technical Manual, Agricultural Field Scale Irrigation Requirements Simulation (AFSIRS) Model, Version 5.5*. Prepared by the Agricultural Engineering Department, University of Florida, Gainesville, FL, for St. Johns River Water Management District, Palatka, FL. Special Publication SJ2008-SP17.
- United States Census Bureau. 2012. *Florida 2010 Census of Population and Housing*. United States Department of Commerce, Economics and Statistics Administration. Washington, D.C.

B

Public Supply Utility Summaries

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This appendix includes summaries of the Public Supply (PS) utilities that provide 0.10 million gallons per day (mgd) or greater of net (finished) potable water for the Upper East Coast (UEC) Planning Area (**Table B-1**). South Florida Water Management District (SFWMD or District) staff updated the utility summaries with data from the Florida Department of Environmental Protection (FDEP) 2019 Reuse Inventory and Drinking Water Database (FDEP 2020a,b), and the SFWMD's water use regulatory database. In addition, proposed water supply projects were updated based on utility reports provided to the SFWMD in November 2020 and through direct contact with utilities in 2019-2020. To help understand the information in the utility summaries, a sample profile with descriptions is provided. The utility summaries are ordered alphabetically by county for easy navigation. **Figures B-1** and **B-2** show the current and future PS service areas and wellfields in Martin County, respectively. **Figures B-3** and **B-4** show the current and future PS service areas and wellfields in St. Lucie County, respectively. A discussion of utilities and the local governments they serve is provided at the end of the appendix. Potential future water conservation savings are not included in the utility summaries. **Chapter 3** of this plan update addresses conservation and potential water savings.

INFO ⓘ
<p>Acronyms and Abbreviations</p> <p>ASR – aquifer storage and recovery</p> <p>FAS – Floridan aquifer system</p> <p>FDEP – Florida Department of Environmental Protection</p> <p>mgd – million gallons per day</p> <p>PS – Public Supply</p> <p>RO – reverse osmosis</p> <p>SAS – surficial aquifer system</p> <p>WTP – water treatment plant</p> <p>WWTF – wastewater treatment facility</p>

Table B-1. Summary of the public supply utilities with a capacity of 0.10 mgd or greater in the UEC Planning Area.

Supply Entity/Facility	SFWMD Permit Number	Gross (Raw) Water (mgd)			FDEP PWS ID	Rated Net (Finished) Capacity (mgd)
		Average Daily Allocation	SAS	FAS		
Martin County						
Indiantown, Village of	43-00041-W	1.17	1.17	0.00	4430667	1.29
Martin County Utilities	43-00102-W	21.00	5.91	15.09	4431891	13.50
Sailfish Point	43-00146-W	0.26	0.00	0.26	4434000	0.35
South Martin Regional Utility	43-00066-W	8.64	4.83	4.76	4430667	8.14
St. Lucie Mobile Village	43-01284-W	0.13	0.13	0.00	4431379	0.17
Stuart, City of	43-00053-W	3.67	3.67	0.00	4430259	6.00
Jupiter, Town of (Martin portion)	50-00010-W	24.41	18.80	11.71	4501491	30.00
Tequesta, Village of (Martin portion)	50-00046-W	4.37	1.10	3.43	4501438	6.33
Martin County Total		63.65	35.61	35.25	--	65.78
St. Lucie County						
Fort Pierce Utilities Authority	56-00085-W	21.13	8.00	13.13	4560490	23.32
Harbour Ridge	56-00449-W	0.13	0.13	0.00	4565002	0.36
Meadowood Community Association	56-00462-W	0.14	0.14	0.00	4565002	0.43
Port St. Lucie Utility Systems Department, City of	56-00142-W	51.38	5.00	46.38	4560954	41.65
Reserve Community Development District	56-00552-W	0.17	0.17	0.00	4565030	0.41
Spanish Lakes Country Club	56-00401-W	0.31	0.31	0.00	4434000	0.48
Spanish Lakes Fairways	56-00627-W	0.27	0.27	0.00	4434000	0.57
St. Lucie County Utilities	56-00406-W	6.82	0.17	6.65	4561689	0.29
St. Lucie West Services District	56-00614-W	3.10	0.00	3.10	4565030	3.40
St. Lucie County Total		83.45	14.19	69.26	--	70.91
UEC Planning Area Total		147.10	49.81	104.51	--	136.69

FAS = Floridan aquifer system; FDEP = Florida Department of Environmental Protection; mgd = million gallons per day; PWS ID = Public Water Supply identification number; SAS = surficial aquifer system; SFWMD = South Florida Water Management District.

SAMPLE UTILITY COMPANY

Service Area: Sample city and portions of unincorporated county.

Description: This description includes water sources, type of WTPs, and other issues of concern to the utility. If the utility produces reclaimed water, information regarding the quantity and customers may be included. If the utility sells or purchases bulk water, that information is listed.

Population and Finished Water Demand							
<div>1</div> <div>2</div>				Existing	Projected		
				2019	2025	2035	2045
Population <div>3</div>				100,000	110,000	120,000	130,000
Average 2015-2019 Per Capita (gallons per day finished water)				100			
Potable Water Demands (daily average annual finished water in mgd)				10.00	11.00	12.00	13.00
SFWMD Consumptive Use Permitted Allocation (mgd)							
Potable Water Source				Permit Number 12-34567-W (expires 2040)			
Surface Water <div>4</div>				2.00			
Surficial Aquifer System				14.00			
Floridan Aquifer System				0.00 <div>5</div>			
Total Allocation				16.00			
FDEP Potable Water Treatment Capacity (mgd) (PWS ID# 1234567) <div>7</div>							
Permitted Capacity by Source <div>6</div>				Existing	Projected		
				2019	2025	2035	2045
Surficial Aquifer System/Surface Water				18.00	18.00	18.00	18.00
Floridan Aquifer System				0.00	2.00	3.00	3.00
Total Potable Capacity <div>8</div>				18.00	20.00	21.00	21.00
FDEP Nonpotable Water Treatment Capacity (mgd)							
Reclaimed Water <div>9</div>				1.00	1.00	4.00	4.00
Projects Summary <div>10</div>							
Water Supply Projects	Source	Completion Date	Total Capital Cost (\$ million)	Projected Cumulative Design Capacity (mgd)			
				2025	2035	2045	
Potable Water							
2.00 mgd expansion of Floridan RO treatment plant	FAS	2021	\$14.00	2.00	2.00	2.00	
Floridan wells and RO treatment plant expansion	FAS	2029	\$4.00	0.00	1.00	1.00	
Total Potable Water <div>11</div>			\$18.00	2.00	3.00	3.00	
Nonpotable Water <div>12</div>							
3.00 mgd reclaimed water facility	Reclaimed	2029	\$5.00	0.00	3.00	3.00	
ASR and irrigation supply	Stormwater	2034	\$2.00	0.00	1.00	1.00	
Total Nonpotable Water <div>13</div>			\$7.00	0.00	4.00	4.00	
Total New Water			\$25.00	2.00	7.00	7.00	
Total Projected New Water Demand <div>14</div>							

- 1 Population** – The 2019 populations were determined by assigning 2010 U.S. Census block data to 2019 PS utility service areas. To project populations to 2045, the relative growth rates for PS utility service areas were developed from county population projections. (See **Appendix A** for more information.)

- 2 Average 2015-2019 Per Capita** (gallons per day finished water) – A PS utility’s per capita is calculated by dividing total net (finished) water produced each year (from monthly operating reports submitted by utilities to the FDEP) by the utility’s permanent population for that year. Each utility’s per capita was calculated for 2015 to 2019, then averaged over the 5 years.

- 3 Potable Water Demands** (daily average annual finished water in mgd) – The 2019 demand was calculated using the PS utility’s average 2015-2019 per capita multiplied by the 2019 service area population. The projected demands for 2020 to 2045 were calculated using the utility’s average 2015-2019 per capita multiplied by the utility’s projected populations for those years.

- 4 Allocation from the Water Use Permit** – The total allocation is composed of gross (raw) surface water and groundwater (from the SAS and FAS) allocations, as described in the utility’s water use permit. The 2019 allocation is assumed to continue through 2045 unless noted otherwise.

- 5 Total Allocation** – The total gross (raw) water allocation in the water use permit. For utilities with multiple sources, total allocation may be less than the sum of the individual source allocations; this is indicated in the appropriate profiles.

- 6 FDEP Permitted Capacity** – The total net (finished) water capacity of the WTPs, as provided by the FDEP (2020b). The capacity is split into the capacity available to process water from surface water as well as the SAS and FAS.

- 7 Planned Project Capacity** – The net (finished) water volumes created by projects listed in the Project Summary (Item 10). Project capacity to be completed by 2025 is shown in the 2025 column, capacity to be completed between 2026 and 2035 is in the 2035 column, and capacity to be completed between 2036 and 2045 is in the 2045 column.

- 8 Total Capacity** – The existing net (finished) water capacity of the WTPs owned/operated by the utility in addition to the volumes of net (finished) water produced by future planned projects.

- 9 Reclaimed Water** – The capacity of the WWTF(s) to produce reclaimed water, as provided by the FDEP (2020a). Additional capacity is from projects planned by the utility (listed under Item 12).

- 10 Project Summary** – A description of the potable water supply projects the utility is proposing to construct. Only projects that produce additional potable water (e.g., wells, WTPs) are included; maintenance or replacement projects are not included. Each project has a water source, anticipated completion date, estimated total capital cost, and projected volume of treatment capacity. Proposed projects have been screened at a planning level but must meet permit issuance criteria.

- 11 Total Projected Cumulative Design Capacity for 2025, 2035, or 2045** – The total volume of potable water supply projects expected to be completed by 2025, 2035, and 2045, respectively. The totals are added to the appropriate projected capacities in Item 7.

- 12 Nonpotable Projects Summary** – A description of the nonpotable water supply projects the utility is proposing to construct. Only projects that produce additional nonpotable water are included; maintenance or replacement projects are not included. Each project has a water source, anticipated completion date, estimated total capital cost, and projected volume of treatment capacity.

- 13 Total Projected Cumulative Design Capacity for Nonpotable 2025, 2035, or 2045** – The total volume of nonpotable water projects expected to be completed by 2025, 2035, and 2045, respectively. If the project provides reclaimed water, totals are added to the appropriate projected capacities in Item 9.

- 14 Total Projected Cumulative Design Capacity for New Water 2025, 2035, or 2045** – The total projected cost and capacity of potable and nonpotable water supply projects the utility is proposing to construct between 2019 and 2045.

MARTIN COUNTY

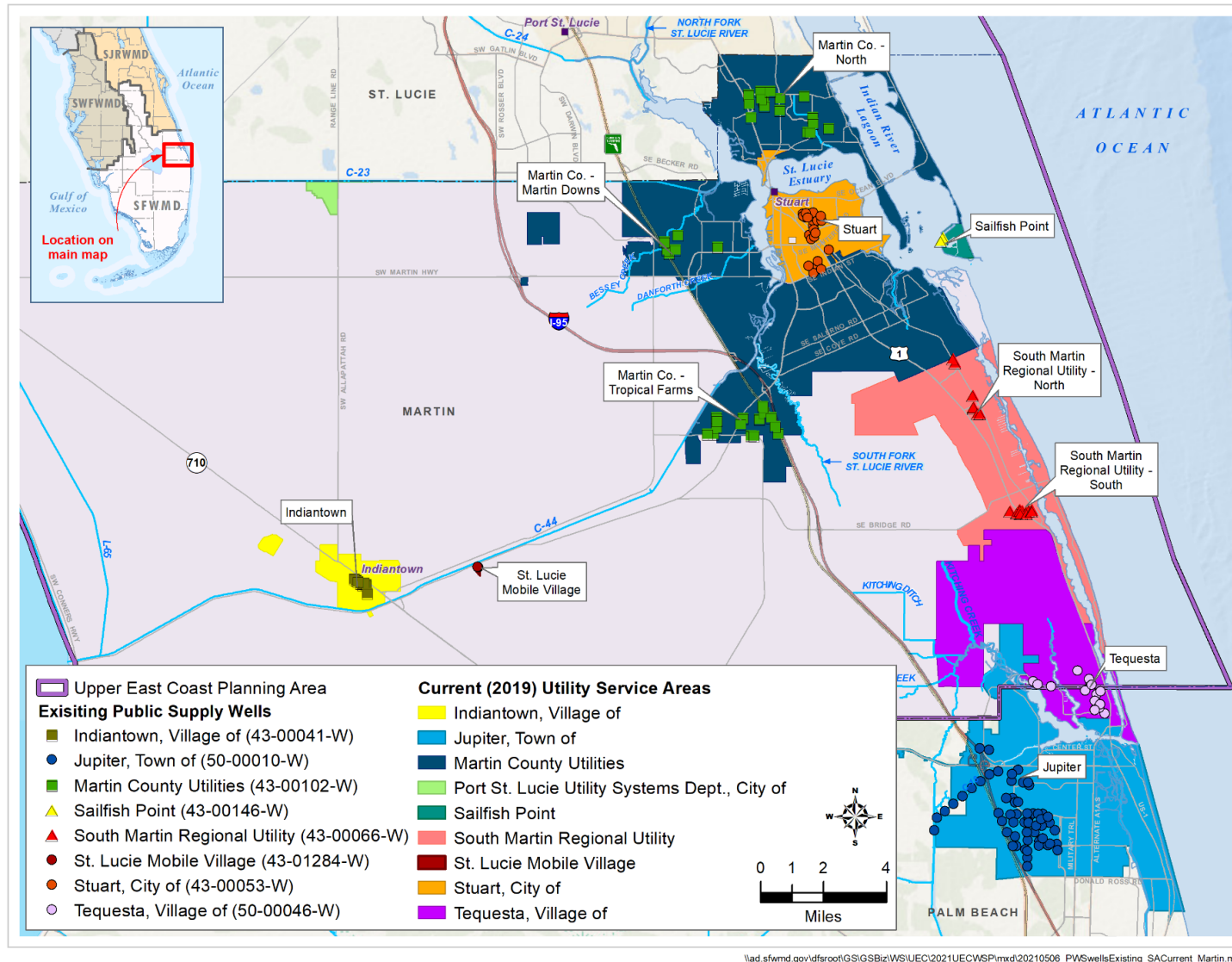
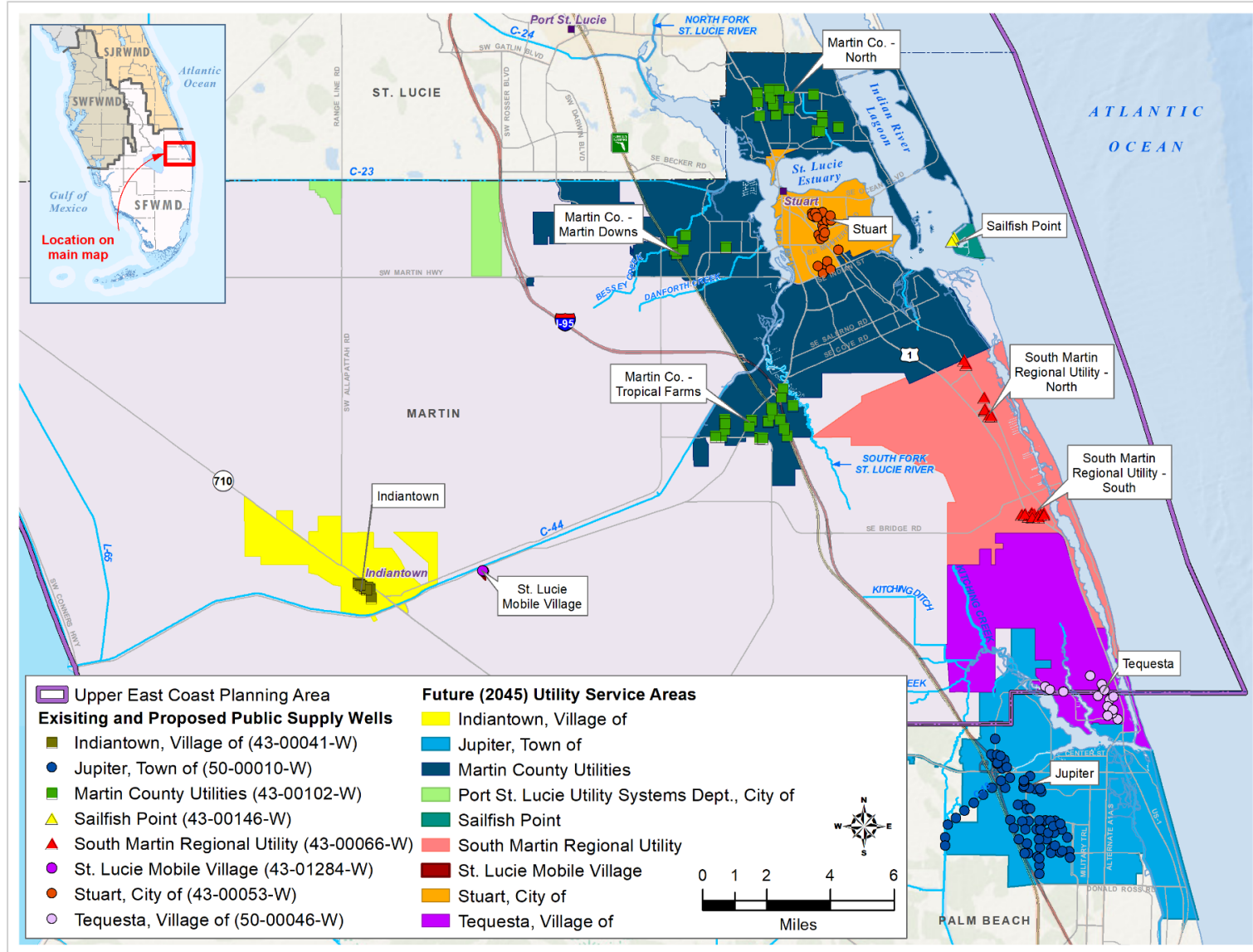


Figure B-1. Current (2019) public supply utility service areas in Martin County.



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Figure B-2. Projected (2045) public supply utility service areas in Martin County.

VILLAGE OF INDIANTOWN

Service Area: Village of Indiantown, unincorporated portions of Martin County, and Indiantown Golf and Country Club

Description: Potable water supplies are obtained from one SAS wellfield, and water is treated at one WTP using lime softening.

Population and Finished Water Demand							
				Existing	Projected		
				2019	2025	2035	2045
Population				6,367	6,943	7,767	8,455
Average 2015-2019 Per Capita (gallons per day finished water)				86			
Potable Water Demands (daily average annual finished water in mgd)				0.55	0.60	0.67	0.73
SFWMD Water Use Permitted Allocation (mgd)							
Potable Water Source				Permit Number 43-00041-W (expires 2029)			
SAS				1.17			
FAS				0.00			
Total Allocation				1.17			
FDEP Potable Water Treatment Capacity (PWS ID # 4430667)							
Permitted Capacity by Source				Cumulative Facility & Project Capacity (mgd)			
				Existing	Projected		
				2019	2025	2035	2045
SAS				1.29	1.29	1.29	1.29
FAS				0.00	0.00	0.00	0.00
Total Potable Capacity				1.29	1.29	1.29	1.29
Nonpotable Alternative Water Source Capacity (mgd)							
Reclaimed Water				0.75	0.75	0.75	0.75
Total Nonpotable Capacity				0.75	0.75	0.75	0.75
Project Summary							
Water Supply Project	Source	Completion Date	Total Capital Cost (\$ million)	Projected Cumulative Design Capacity (mgd)			
				2025	2035	2045	
Potable Water							
No Projects							
Total Potable Water			\$0.00	0.00	0.00	0.00	0.00
Nonpotable Water							
No Projects							
Total Nonpotable Water			\$0.00	0.00	0.00	0.00	0.00
Total New Water			\$0.00	0.00	0.00	0.00	0.00

TOWN OF JUPITER

Service Area: Towns of Jupiter and Juno Beach, and unincorporated areas of Martin and Palm Beach counties

Description: Potable water supplies are obtained from four SAS and FAS wellfields. FAS water is treated at an RO WTP and SAS water is treated at a nanofiltration WTP at the same location.

Population and Finished Water Demand							
				Existing	Projected		
				2019	2025	2035	2045
Population (Martin County portion)				2,257	2,416	2,617	2,770
Average 2015-2019 Per Capita (gallons per day finished water)				201			
Potable Water Demands (daily average annual finished water in mgd)				0.45	0.49	0.53	0.56
SFWMD Water Use Permitted Allocation (mgd)							
Potable Water Source				Permit Number 50-00010-W (expires 2030)			
SAS				18.80			
FAS				11.71			
Total Allocation				24.41 ^a			
FDEP Potable Water Treatment Capacity (PWS ID # 4501491)							
Permitted Capacity by Source				Cumulative Facility & Project Capacity (mgd)			
				Existing	Projected		
				2019	2025	2035	2045
SAS				16.30	16.30	16.30	16.30
FAS				13.70	13.70	13.70	13.70
Total Potable Capacity				30.00	30.00	30.00	30.00
Nonpotable Alternative Water Source Capacity (mgd)							
Reclaimed Water				0.00	0.00	0.00	0.00
Total Nonpotable Capacity				0.00	0.00	0.00	0.00
Project Summary							
Water Supply Project	Source	Completion Date	Total Capital Cost (\$ million)	Projected Cumulative Design Capacity (mgd)			
				2025	2035	2045	
Potable Water							
No Projects							
Total Potable Water			\$0.00	0.00	0.00		0.00
Nonpotable Water							
No Projects							
Total Nonpotable Water			\$0.00	0.00	0.00		0.00
Total New Water			\$0.00	0.00	0.00		0.00

^a The SAS and FAS permit allocations do not always total exactly. See the SFWMD water use permit for further information.

MARTIN

MARTIN COUNTY UTILITIES

Service Area: Unincorporated Martin County, including Jensen Beach, Martin Downs, Palm City, Port Salerno, Tropical Farms, Miles Grant Golf and Country Club, Indian River Plantation, Floridian National Golf Club; portions of City of Stuart; all of Town of Ocean Breeze; Piper's Landing Yacht and Country Club; Town of Sewall's Point; and the southern portion of Hutchinson Island in St. Lucie County

Description: Potable water supplies are obtained from two SAS and FAS wellfields (North Jensen and Tropical Farms) and one SAS wellfield (Martin Downs), treated at two WTPs (North Jensen Beach and Tropical Farms) using RO. Martin County provides up to 1.00 mgd of potable water to the City of Stuart through 2028.

Population and Finished Water Demand							
				Existing	Projected		
				2019	2025	2035	2045
Population				96,097	103,218	112,320	119,407
Average 2015-2019 Per Capita (gallons per day finished water)				108			
Potable Water Demands (daily average annual finished water in mgd)				10.38	11.15	12.13	12.90
Bulk Potable Water Demands (daily average annual finished water in mgd delivered directly to City of Stuart)				1.00	1.00	0.00	0.00
Total Potable Water Demands (daily average annual finished water in mgd)				11.38	12.15	12.13	12.90
SFWMD Water Use Permitted Allocation (mgd)							
Potable Water Source				Permit Number 43-00102-W (expires 2035)			
SAS				5.91			
FAS				15.09			
Total Allocation				21.00 ^a			
FDEP Potable Water Treatment Capacity (PWS ID # 4431891)							
Permitted Capacity by Source				Cumulative Facility & Project Capacity (mgd)			
				Existing	Projected		
				2019	2025	2035	2045
SAS				4.19 ^b	4.19 ^b	4.19 ^b	4.19 ^b
FAS				9.31 ^b	9.31 ^b	9.31 ^b	9.31 ^b
Total Potable Capacity				13.50	13.50	13.50	13.50
Nonpotable Alternative Water Source Capacity (mgd)							
Reclaimed Water				8.66	8.66	8.66	8.66
Total Nonpotable Capacity				8.66	8.66	8.66	8.66
Project Summary							
Water Supply Project	Source	Completion Date	Total Capital Cost (\$ million)	Projected Cumulative Design Capacity (mgd)			
				2025	2035	2045	
Potable Water							
Expand Tropical Farms FAS wellfield, two wells	FAS	2021	\$3.77	4.70	4.70	4.70	
Expand North Jensen Beach FAS wellfield, one well	FAS	2022	\$3.30	2.00	2.00	2.00	
Expand Tropical Farms FAS wellfield, one well	FAS	2025	\$4.00	2.00	2.00	2.00	
Total Potable Water			\$11.07	8.70	8.70	8.70	
Nonpotable Water							
No Projects							
Total Nonpotable Water			\$0.00	0.00	0.00	0.00	
Total New Water			\$11.07	8.70	8.70	8.70	

^a The SAS and FAS permit allocations do not always total exactly. See the SFWMD water use permit for further information.

^b Water is treated at two WTPs. North Jensen Beach uses RO and traditional filtration, with a 2019 FDEP permitted capacity of 5.50 mgd. Tropical Farms uses lime softening and RO, with a 2019 FDEP permitted capacity of 8.00 mgd. Water is blended approximately 31% SAS to 69% FAS.

SAILFISH POINT

Service Area: Unincorporated Martin County serving Sailfish Point development on South Hutchinson Island

Description: Potable water supplies are obtained from one FAS wellfield, treated at one WTP using RO.

Population and Finished Water Demand							
				Existing	Projected		
				2019	2025	2035	2045
Population				1,054	1,095	1,119	1,122
Average 2015-2019 Per Capita (gallons per day finished water)				146			
Potable Water Demands (daily average annual finished water in mgd)				0.15	0.16	0.16	0.16
SFWMD Water Use Permitted Allocation (mgd)							
Potable Water Source				Permit Number 43-00146-W (expires 2039)			
SAS				0.00			
FAS				0.26			
Total Allocation				0.26			
FDEP Potable Water Treatment Capacity (PWS ID # 4434000)							
Permitted Capacity by Source				Cumulative Facility & Project Capacity (mgd)			
				Existing	Projected		
				2019	2025	2035	2045
SAS				0.00	0.00	0.00	0.00
FAS				0.35	0.35	0.35	0.35
Total Potable Capacity				0.35	0.35	0.35	0.35
Nonpotable Alternative Water Source Capacity (mgd)							
Reclaimed Water				0.25	0.25	0.25	0.25
Total Nonpotable Capacity				0.25	0.25	0.25	0.25
Project Summary							
Water Supply Project	Source	Completion Date	Total Capital Cost (\$ million)	Projected Cumulative Design Capacity (mgd)			
				2025	2035	2045	
Potable Water							
No Projects							
Total Potable Water			\$0.00	0.00	0.00	0.00	
Nonpotable Water							
No Projects							
Total Nonpotable Water			\$0.00	0.00	0.00	0.00	
Total New Water			\$0.00	0.00	0.00	0.00	

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SOUTH MARTIN REGIONAL UTILITY

Service Area: Town of Jupiter Island and portions of southeastern unincorporated Martin County, including Hobe Sound

Description: Potable water supplies are obtained from two wellfields (North and South). SAS withdrawals from the North wellfield are treated at the North WTP using nanofiltration. SAS and FAS withdrawals from the South wellfield are treated at the South WTP using RO.

Population and Finished Water Demand							
				Existing	Projected		
				2019	2025	2035	2045
Population				21,126	22,286	23,473	24,228
Average 2015-2019 Per Capita (gallons per day finished water)				177			
Potable Water Demands (daily average annual finished water in mgd)				3.74	3.94	4.15	4.29
SFWMD Water Use Permitted Allocation (mgd)							
Potable Water Source				Permit Number 43-00066-W (expires 2032)			
SAS				4.83			
FAS				4.76			
Total Allocation				8.64 ^a			
FDEP Potable Water Treatment Capacity (PWS ID # 4430624)							
Permitted Capacity by Source				Cumulative Facility & Project Capacity (mgd)			
				Existing	Projected		
				2019	2025	2035	2045
SAS				6.14	6.14	6.14	6.14
FAS				2.00	2.00	4.20	4.20
Total Potable Capacity				8.14	10.34	10.34	10.34
Nonpotable Alternative Water Source Capacity (mgd)							
Reclaimed Water				1.40	1.40	1.40	1.40
Total Nonpotable Capacity				1.40	1.40	1.40	1.40
Project Summary							
Water Supply Project	Source	Completion Date	Total Capital Cost (\$ million)	Projected Cumulative Design Capacity (mgd)			
				2025	2035	2045	
Potable Water							
RO Train #3 project, expand RO WTP from 2.00 to 4.20 mgd and add one FAS well (RO Well #3)	FAS	2035	\$3.50	0.00	2.20	2.20	
Total Potable Water			\$3.50	0.00	2.20	2.20	
Nonpotable Water							
Expand reclaimed water treatment capacity, second phase of project increases capacity from 1.40 to 1.60 mgd	Reclaimed	2026	\$1.26	0.00	0.20	0.20	
Total Nonpotable Water			\$1.26	0.00	0.20	0.20	
Total New Water			\$4.76	0.00	2.40	2.40	

^a The SAS and FAS permit allocations do not always total exactly. See the SFWMD water use permit for further information.

ST. LUCIE MOBILE VILLAGE

Service Area: Unincorporated Martin County serving St. Lucie Mobile Village

Description: Potable water supplies are obtained from one SAS wellfield, treated at one WTP using RO.

Population and Finished Water Demand							
				Existing	Projected		
				2019	2025	2035	2045
Population				801	844	887	913
Average 2015-2019 Per Capita (gallons per day finished water)				112			
Potable Water Demands (daily average annual finished water in mgd)				0.09	0.09	0.10	0.10
SFWMD Water Use Permitted Allocation (mgd)							
Potable Water Source				Permit Number 43-01284-W (expires 2023)			
SAS				0.13			
FAS				0.00			
Total Allocation				0.13			
FDEP Potable Water Treatment Capacity (PWS ID # 4431379)							
Permitted Capacity by Source				Cumulative Facility & Project Capacity (mgd)			
				Existing	Projected		
				2019	2025	2035	2045
SAS				0.17	0.17	0.17	0.17
FAS				0.00	0.00	0.00	0.00
Total Potable Capacity				0.17	0.17	0.17	0.17
Nonpotable Alternative Water Source Capacity (mgd)							
Reclaimed Water				0.00	0.00	0.00	0.00
Total Nonpotable Capacity				0.00	0.00	0.00	0.00
Project Summary							
Water Supply Project	Source	Completion Date	Total Capital Cost (\$ million)	Projected Cumulative Design Capacity (mgd)			
				2025	2035	2045	
Potable Water							
No Projects							
Total Potable Water			\$0.00	0.00	0.00	0.00	
Nonpotable Water							
No Projects							
Total Nonpotable Water			\$0.00	0.00	0.00	0.00	
Total New Water			\$0.00	0.00	0.00	0.00	

MARTIN

CITY OF STUART

Service Area: City of Stuart and unincorporated areas of Martin County

Description: Potable water supplies are obtained from one SAS wellfield, treated at one WTP using lime softening. The City purchases bulk water from Martin County Utilities and is proposing one FAS wellfield and RO WTP.

Population and Finished Water Demand							
				Existing	Projected		
				2019	2025	2035	2045
Population				20,596	21,707	22,823	23,518
Average 2015-2019 Per Capita (gallons per day finished water)				145			
Potable Water Demands (daily average annual finished water in mgd)				2.99	3.15	3.31	3.41
SFWMD Water Use Permitted Allocation (mgd)							
Potable Water Source				Permit Number 43-00053-W (expires 2029)			
SAS				3.67			
FAS				0.00			
Bulk Raw Water Purchase (from Martin County Utilities)				1.00 ^a			
Total Allocation (excluding bulk water)				3.67			
FDEP Potable Water Treatment Capacity (PWS ID # 4430259)							
Permitted Capacity by Source				Cumulative Facility & Project Capacity (mgd)			
				Existing	Projected		
				2019	2025	2035	2045
SAS				6.00	6.00	6.00	6.00
FAS				0.00	1.00	3.00	3.00
Total Potable Capacity				6.00	7.00	9.00	9.00
Nonpotable Alternative Water Source Capacity (mgd)							
Reclaimed Water				3.60	3.60	3.60	3.60
Total Nonpotable Capacity				3.60	3.60	3.60	3.60
Project Summary							
Water Supply Project	Source	Completion Date	Total Capital Cost (\$ million)	Projected Cumulative Design Capacity (mgd)			
				2025	2035	2045	
Potable Water							
FAS well and new 1.00 mgd RO facility (Phase 1)	FAS	2023	\$34.66	1.00	1.00	1.00	
FAS well and 1.00 mgd RO facility expansion (Phase 2)	FAS	2027	\$5.24	0.00	1.00	1.00	
FAS well and 1.00 mgd RO facility expansion (Phase 3)	FAS	2032	\$7.86	0.00	1.00	1.00	
Total Potable Water			\$47.76	1.00	3.00	3.00	
Nonpotable Water							
No Projects							
Total Nonpotable Water			\$0.00	0.00	0.00	0.00	
Total New Water			\$47.76	1.00	3.00	3.00	

^a The City of Stuart has a 20-year Bulk Water and Wastewater Service Agreement with Martin County Utilities to supply up to 1.00 mgd of treated water, beginning in 2013.

VILLAGE OF TEQUESTA

Service Area: Village of Tequesta, towns of Jupiter Inlet Colony and Jupiter Island, and unincorporated Palm Beach and Martin counties

Description: Potable water supplies are obtained from three SAS and FAS wellfields. SAS water is treated at one WTP using sand filtration. FAS water is treated at an RO WTP.

Population and Finished Water Demand							
				Existing	Projected		
				2019	2025	2035	2045
Population (Martin County portion)				3,533	3,679	3,777	3,804
Average 2015-2019 Per Capita (gallons per day finished water)				261			
Potable Water Demands (daily average annual finished water in mgd)				0.92	0.96	0.99	0.99
SFWMD Water Use Permitted Allocation (mgd)							
Potable Water Source				Permit Number 50-00046-W (expires 2031)			
SAS				1.10			
FAS				3.43			
Total Allocation				4.37 ^a			
FDEP Potable Water Treatment Capacity (PWS ID # 4501438)							
Permitted Capacity by Source				Cumulative Facility & Project Capacity (mgd)			
				Existing	Projected		
				2019	2025	2035	2045
SAS				2.73	2.73	2.73	2.73
FAS				3.60	3.60	3.60	3.60
Total Potable Capacity				6.33	6.33	6.33	6.33
Nonpotable Alternative Water Source Capacity (mgd)							
Reclaimed Water				0.00	0.00	0.00	0.00
Total Nonpotable Capacity				0.00	0.00	0.00	0.00
Project Summary							
Water Supply Project	Source	Completion Date	Total Capital Cost (\$ million)	Projected Cumulative Design Capacity (mgd)			
				2025	2035	2045	
Potable Water							
No Projects							
Total Potable Water			\$0.00	0.00	0.00	0.00	
Nonpotable Water							
No Projects							
Total Nonpotable Water			\$0.00	0.00	0.00	0.00	
Total New Water			\$0.00	0.00	0.00	0.00	

^a The SAS and FAS permit allocations do not always total exactly. See the SFWMD water use permit for further information.

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ST. LUCIE COUNTY

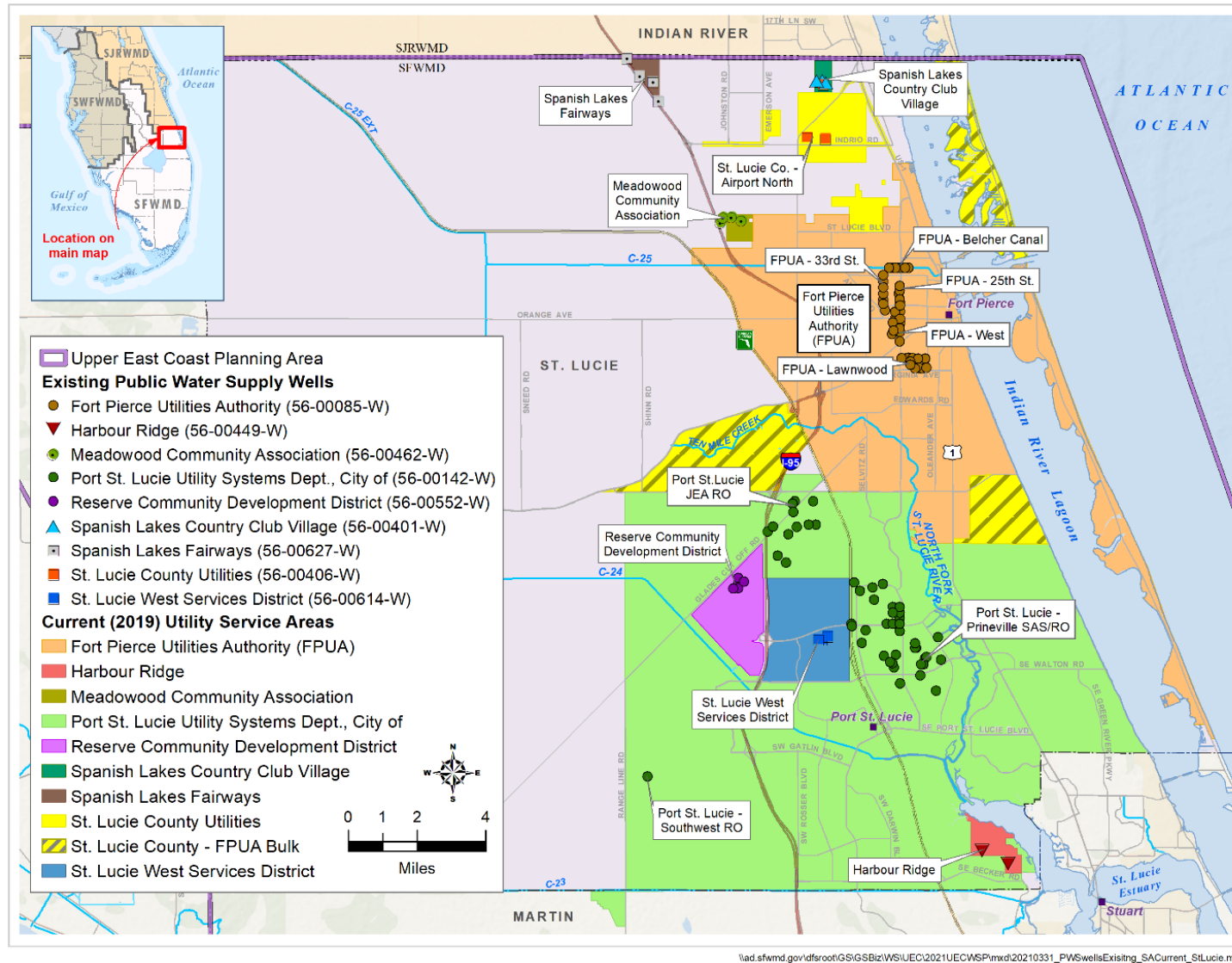
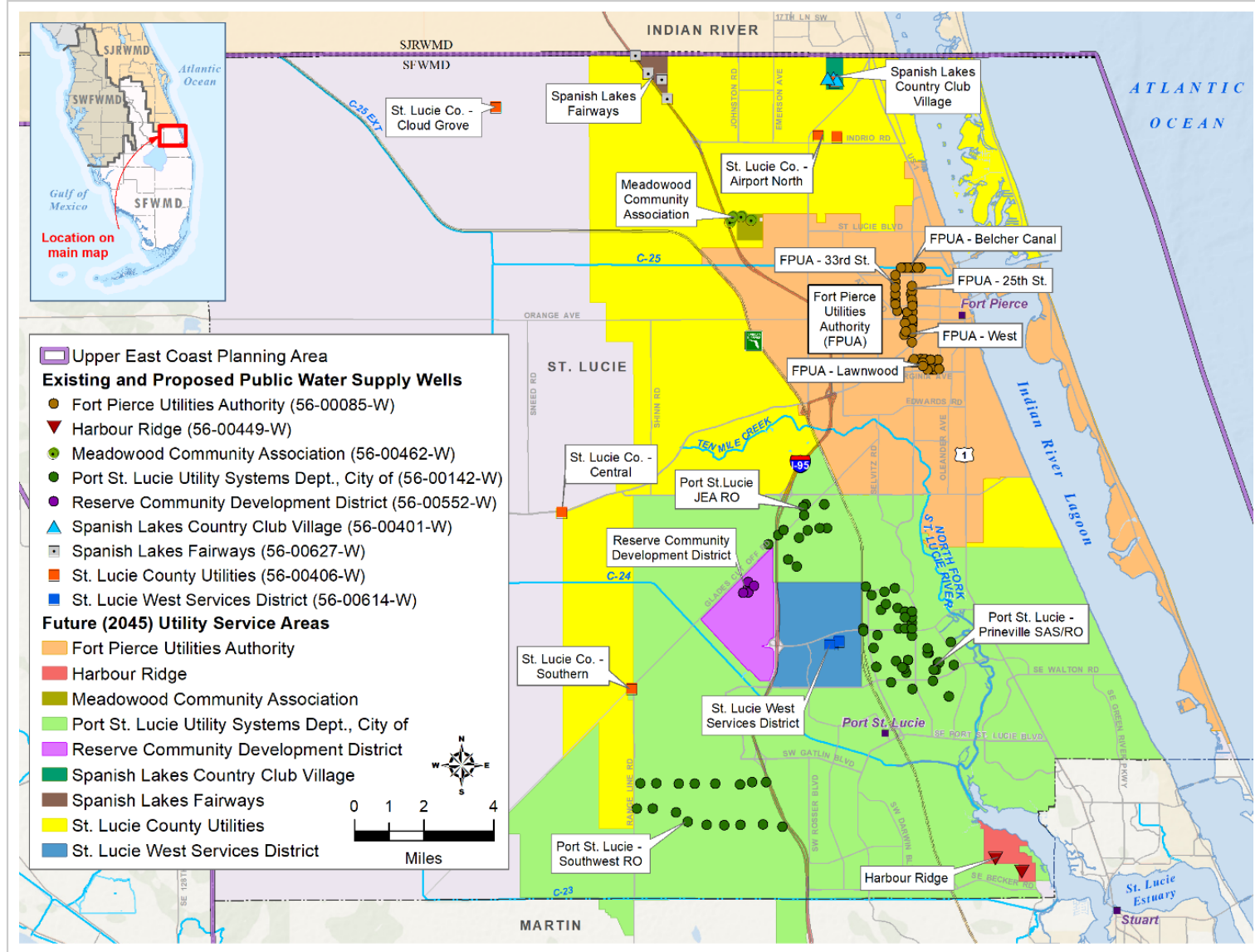


Figure B-3. Current (2019) public supply utility service areas in St. Lucie County.



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Figure B-4. Projected (2045) public supply utility service areas in St. Lucie County.

FORT PIERCE UTILITIES AUTHORITY

Service Area: City of Fort Pierce

Description: Potable water supplies are obtained from five wellfields: Belcher Canal (SAS), 25th Street (SAS), West (SAS and FAS), Lawnwood (SAS), and 33rd Street (FAS). The Henry A. Gahn WTP uses lime softening for SAS withdrawals and RO for FAS withdrawals. The utility provides up to 1.01 mgd potable water to St. Lucie County Utilities through an inter-local agreement expiring in 2028.

ST LUCIE

Population and Finished Water Demand							
				Existing	Projected		
				2019	2025	2035	2045
Population				46,615	53,432	49,269	54,635
Average 2015-2019 Per Capita (gallons per day finished water)				168			
Potable Water Demands (daily average annual finished water in mgd)				7.83	8.98	8.28	9.18
Bulk Potable Water Demands (daily average annual finished water in mgd delivered directly to St. Lucie County Utilities)				1.01	1.01	0.00	0.00
Total Potable Water Demands (daily average annual finished water in mgd)				8.84	9.99	8.28	9.18
SFWMD Water Use Permitted Allocation (mgd)							
Potable Water Source				Permit Number 56-00085-W (expires 2027)			
SAS				8.00			
FAS				13.13			
Total Allocation				21.13			
FDEP Potable Water Treatment Capacity (PWS ID # 4560490)							
Permitted Capacity by Source				Cumulative Facility & Project Capacity (mgd)			
				Existing	Projected		
				2019	2025	2035	2045
SAS				12.99	12.99	12.99	12.99
FAS				10.33	10.33	10.33	10.33
Total Potable Capacity				23.32	23.32	23.32	23.32
Nonpotable Alternative Water Source Capacity (mgd)							
Reclaimed Water				10.00	10.00	10.00	17.00
Total Nonpotable Capacity				10.00	10.00	10.00	17.00
Project Summary							
Water Supply Project	Source	Completion Date	Total Capital Cost (\$ million)	Projected Cumulative Design Capacity (mgd)			
				2025	2035	2045	
Potable Water							
No Projects							
Total Potable Water			\$0.00	0.00	0.00	0.00	
Nonpotable Water							
Mainland Water Reclamation WWTF ^a	Reclaimed	2045	\$131.50	0.00	0.00		7.00
Total Nonpotable Water			\$131.50	0.00	0.00		7.00
Total New Water			\$131.50	0.00	0.00		7.00

^a Expected to treat a total of 7.00 mgd of wastewater flows for St. Lucie County and Fort Pierce combined, with an estimated 3.00 mgd of reclaimed water produced.

HARBOUR RIDGE

Service Area: Unincorporated St. Lucie County serving Harbour Ridge Country Club

Description: Potable water supplies are obtained from one SAS wellfield, treated at one WTP using lime softening.

Population and Finished Water Demand							
				Existing	Projected		
				2019	2025	2035	2045
Population				1,042	1,165	1,295	1,397
Average 2015-2019 Per Capita (gallons per day finished water)				117			
Potable Water Demands (daily average annual finished water in mgd)				0.12	0.14	0.15	0.16
SFWMD Water Use Permitted Allocation (mgd)							
Potable Water Source				Permit Number 56-00449-W (expires 2029)			
SAS				0.13			
FAS				0.00			
Total Allocation				0.13			
FDEP Potable Water Treatment Capacity (PWS ID # 4565002)							
Permitted Capacity by Source				Cumulative Facility & Project Capacity (mgd)			
				Existing	Projected		
				2019	2025	2035	2045
SAS				0.36	0.36	0.36	0.36
FAS				0.00	0.00	0.00	0.00
Total Potable Capacity				0.36	0.36	0.36	0.36
Nonpotable Alternative Water Source Capacity (mgd)							
Reclaimed Water				0.12	0.12	0.12	0.12
Total Nonpotable Capacity				0.12	0.12	0.12	0.12
Project Summary							
Water Supply Project	Source	Completion Date	Total Capital Cost (\$ million)	Projected Cumulative Design Capacity (mgd)			
				2025	2035	2045	
Potable Water							
No Projects							
Total Potable Water			\$0.00	0.00	0.00	0.00	
Nonpotable Water							
No Projects							
Total Nonpotable Water			\$0.00	0.00	0.00	0.00	
Total New Water			\$0.00	0.00	0.00	0.00	

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MEADOWOOD COMMUNITY ASSOCIATION

Service Area: Unincorporated St. Lucie County serving Meadowood Community Association

Description: Potable water supplies are obtained from one SAS wellfield, treated at one WTP using lime softening.

Population and Finished Water Demand							
				Existing	Projected		
				2019	2025	2035	2045
Population				589	654	654	654
Average 2015-2019 Per Capita (gallons per day finished water)				121			
Potable Water Demands (daily average annual finished water in mgd)				0.07	0.08	0.08	0.08
SFWMD Water Use Permitted Allocation (mgd)							
Potable Water Source				Permit Number 56-00462-W (expires 2032)			
SAS				0.14			
FAS				0.00			
Total Allocation				0.14			
FDEP Potable Water Treatment Capacity (PWS ID # 4565002)							
Permitted Capacity by Source				Cumulative Facility & Project Capacity (mgd)			
				Existing	Projected		
				2019	2025	2035	2045
SAS				0.43	0.43	0.43	0.43
FAS				0.00	0.00	0.00	0.00
Total Potable Capacity				0.43	0.43	0.43	0.43
Nonpotable Alternative Water Source Capacity (mgd)							
Reclaimed Water				0.11	0.11	0.11	0.11
Total Nonpotable Capacity				0.11	0.11	0.11	0.11
Project Summary							
Water Supply Project	Source	Completion Date	Total Capital Cost (\$ million)	Projected Cumulative Design Capacity (mgd)			
				2025	2035	2045	
Potable Water							
No Projects							
Total Potable Water			\$0.00	0.00	0.00	0.00	
Nonpotable Water							
No Projects							
Total Nonpotable Water			\$0.00	0.00	0.00	0.00	
Total New Water			\$0.00	0.00	0.00	0.00	

CITY OF PORT ST. LUCIE UTILITY SYSTEMS DEPARTMENT

Service Area: City of Port St. Lucie (including a portion of the Reserve development) and portions of unincorporated St. Lucie County

Description: Potable water supplies are obtained from one SAS wellfield and two FAS wellfields. The James E. Anderson WTP uses RO to treat FAS water from the James E. Anderson wellfield. The Prineville WTP uses lime softening and RO to treat SAS and FAS water from the Prineville wellfield. The City is proposing an additional RO WTP, FAS wellfield, ASR system, and surface water storage area.

Population and Finished Water Demand							
				Existing	Projected		
				2019	2025	2035	2045
Population				187,815	227,922	279,948	324,447
Average 2015-2019 Per Capita (gallons per day finished water)				89			
Potable Water Demands (daily average annual finished water in mgd)				16.71	20.29	24.91	28.88
SFWMD Water Use Permitted Allocation (mgd)							
Potable Water Source				Permit Number 56-00142-W (expires 2028)			
SAS				5.00			
FAS				46.38			
Total Allocation				51.38			
FDEP Potable Water Treatment Capacity (PWS ID # 4560954)							
Permitted Capacity by Source				Cumulative Facility & Project Capacity (mgd)			
				Existing	Projected		
				2019	2025	2035	2045
Surface Water Treatment Capacity				0.00	0.00	0.00	10.00
SAS Treatment Capacity				8.00	8.00	8.00	8.00
FAS Treatment Capacity				33.65	36.31	46.31	46.31
Total Potable Capacity				41.65	44.31	54.31	64.31
Nonpotable Alternative Water Source Capacity (mgd)							
Reclaimed Water Production Capacity - Westport WWTF				6.00	6.00	6.00	6.00
Reclaimed Water Production Capacity – Glades WWTF				12.00	12.00	12.00	18.00
ASR Storage Capacity				0.00	0.00	2.50	7.50
Surface Water Storage Capacity				0.00	5.60	18.89	18.89
Total Nonpotable Capacity				18.00	23.60	39.39	50.39
Project Summary							
Water Supply Project	Source	Completion Date	Total Capital Cost (\$ million)	Projected Cumulative Design Capacity (mgd)			
				2025	2035	2045	
Potable Water							
James E. Anderson WTP Expansion Phase III – FAS Well F-19	FAS	2025	\$3.09	2.66	2.66	2.66	
10 mgd McCarty Ranch Surface Water WTP	Surface Water	2045	\$147.00	0.00	0.00	10.00	
Rangeline WTP and FAS wells	FAS	2035	\$75.00	0.00	10.00	10.00	
Total Potable Water			\$225.09	2.66	12.66	22.66	

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Project Summary						
Water Supply Project	Source	Completion Date	Total Capital Cost (\$ million)	Projected Cumulative Design Capacity (mgd)		
				2025	2035	2045
Nonpotable Water						
Reuse distribution water main (24-inch, 10.15 mgd) from Glades WWTF to Tradition	Reclaimed	2021	\$3.10	0.00 ^a	0.00 ^a	0.00 ^a
Surface water storage component of McCarty Ranch Water Quality Restoration Project, Areas 1-6, capturing excess water from the C-23 Canal	Surface Water	2022	\$8.30	2.30 ^b	5.59 ^b	5.59 ^b
Surface water storage component of McCarty Ranch Extension Water Quality Restoration Project Area 7, capturing excess water from the C-23 Canal	Surface Water	2025	\$5.00	3.30 ^b	3.30 ^b	3.30 ^b
350-acre McCarty Ranch Reservoir, capturing excess water from the C-23 Canal	Surface Water	2030	\$60.00	0.00	10.0 ^c	10.0 ^c
ASR wells at McCarty Ranch WTP, 2.50 mgd in 2035 and 5.00 mgd in 2045	Surface Water/ASR	2035-2045	\$14.00	0.00	2.50	7.50
Far West reclaimed water main, 9.00 mgd	Reclaimed	2036	\$6.60	0.00 ^a	0.00 ^a	0.00 ^a
Glades WWTF treatment capacity expansion from 12.00 to 18.00 mgd and interconnect with Westport WWTF	Reclaimed	2045	\$90.00	0.00	0.00	6.00
Total Nonpotable Water			\$187.00	5.60	21.39	32.39
Total New Water			\$412.09	8.26	34.05	55.05

^a Adds distribution capacity but does not increase the actual treatment capacity. See **Appendix E** for more information.

^b Surface water storage capacity, based on modeled recoverable volume of storage for water supply (Tetra Tech 2019).

^c Surface water storage capacity, based on modeled recoverable volume with the ASR wells and the total surface water storage within the McCarty Ranch Water Quality Restoration Project Areas 1-7 and the McCarty Ranch Reservoir (Tetra Tech 2019).

RESERVE COMMUNITY DEVELOPMENT DISTRICT

Service Area: The Reserve development located within the City of Port St. Lucie

Description: Potable water supplies are obtained from one SAS wellfield, treated at one WTP using lime softening. Up to 0.30 mgd of bulk potable water is purchased from St. Lucie West Services District through 2024 with automatic 5-year renewals.

Population and Finished Water Demand							
				Existing	Projected		
				2019	2025	2035	2045
Population				3,353	3,564	3,685	3,735
Average 2015-2019 Per Capita (gallons per day finished water)				68			
Potable Water Demands (daily average annual finished water in mgd)				0.23	0.24	0.25	0.25
SFWMD Water Use Permitted Allocation (mgd)							
Potable Water Source				Permit Number 56-00552-W (expires 2029)			
SAS				0.17			
FAS				0.00			
Bulk Water Purchased from St. Lucie West Services District				0.30			
Total Allocation (excluding bulk purchase)				0.17			
FDEP Potable Water Treatment Capacity (PWS ID # 4565030)							
Permitted Capacity by Source				Cumulative Facility & Project Capacity (mgd)			
				Existing	Projected		
				2019	2025	2035	2045
SAS				0.41	0.41	0.41	0.41
FAS				0.00	0.00	0.00	0.00
Total Potable Capacity				0.41	0.41	0.41	0.41
Nonpotable Alternative Water Source Capacity (mgd)							
Reclaimed Water				0.00	0.00	0.00	0.00
Total Nonpotable Capacity				0.00	0.00	0.00	0.00
Project Summary							
Water Supply Project	Source	Completion Date	Total Capital Cost (\$ million)	Projected Cumulative Design Capacity (mgd)			
				2025	2035	2045	
Potable Water							
No Projects							
Total Potable Water			\$0.00	0.00	0.00	0.00	
Nonpotable Water							
No Projects							
Total Nonpotable Water			\$0.00	0.00	0.00	0.00	
Total New Water			\$0.00	0.00	0.00	0.00	

ST LUCIE

SPANISH LAKES COUNTRY CLUB

Service Area: Unincorporated St. Lucie County serving Spanish Lakes Country Club

Description: Potable water supplies are obtained from one SAS wellfield, treated at one WTP using RO.

Population and Finished Water Demand							
				Existing	Projected		
				2019	2025	2035	2045
Population				1,649	1,781	1,781	1,781
Average 2015-2019 Per Capita (gallons per day finished water)				109			
Potable Water Demands (daily average annual finished water in mgd)				0.18	0.19	0.19	0.19
SFWMD Water Use Permitted Allocation (mgd)							
Potable Water Source				Permit Number 56-00401-W (expires 2026)			
SAS				0.31			
FAS				0.00			
Total Allocation				0.31			
FDEP Potable Water Treatment Capacity (PWS ID # 4434000)							
Permitted Capacity by Source				Cumulative Facility & Project Capacity (mgd)			
				Existing	Projected		
				2019	2025	2035	2045
SAS				0.48	0.48	0.48	0.48
FAS				0.00	0.00	0.00	0.00
Total Potable Capacity				0.48	0.48	0.48	0.48
Nonpotable Alternative Water Source Capacity (mgd)							
Reclaimed Water				0.16	0.16	0.16	0.16
Total Nonpotable Capacity				0.16	0.16	0.16	0.16
Project Summary							
Water Supply Project	Source	Completion Date	Total Capital Cost (\$ million)	Projected Cumulative Design Capacity (mgd)			
				2025	2035	2045	
Potable Water							
No Projects							
Total Potable Water			\$0.00	0.00	0.00	0.00	
Nonpotable Water							
No Projects							
Total Nonpotable Water			\$0.00	0.00	0.00	0.00	
Total New Water			\$0.00	0.00	0.00	0.00	

SPANISH LAKES FAIRWAYS

Service Area: Unincorporated St. Lucie County serving Spanish Lakes Fairways

Description: Potable water supplies are obtained from one SAS wellfield, treated at one WTP using RO.

Population and Finished Water Demand							
				Existing	Projected		
				2019	2025	2035	2045
Population				2,241	2,322	2,307	2,251
Average 2015-2019 Per Capita (gallons per day finished water)				94			
Potable Water Demands (daily average annual finished water in mgd)				0.21	0.22	0.22	0.21
SFWMD Water Use Permitted Allocation (mgd)							
Potable Water Source				Permit Number 56-00627-W (expires 2024)			
SAS				0.27			
FAS				0.00			
Total Allocation				0.27			
FDEP Potable Water Treatment Capacity (PWS ID # 4434000)							
Permitted Capacity by Source				Cumulative Facility & Project Capacity (mgd)			
				Existing	Projected		
				2019	2025	2035	2045
SAS				0.57	0.57	0.57	0.57
FAS				0.00	0.00	0.00	0.00
Total Potable Capacity				0.57	0.57	0.57	0.57
Nonpotable Alternative Water Source Capacity (mgd)							
Reclaimed Water				0.25	0.25	0.25	0.25
Total Nonpotable Capacity				0.25	0.25	0.25	0.25
Project Summary							
Water Supply Project	Source	Completion Date	Total Capital Cost (\$ million)	Projected Cumulative Design Capacity (mgd)			
				2025	2035	2045	
Potable Water							
No Projects							
Total Potable Water			\$0.00	0.00	0.00	0.00	
Nonpotable Water							
No Projects							
Total Nonpotable Water			\$0.00	0.00	0.00	0.00	
Total New Water			\$0.00	0.00	0.00	0.00	

ST LUCIE

ST. LUCIE COUNTY UTILITIES

Service Area: Unincorporated areas of St. Lucie County, including North Hutchinson Island

Description: Potable water supplies are obtained from one SAS wellfield, treated at one WTP using RO. St. Lucie County Utilities receives up to 1.01 mgd potable bulk water from Fort Pierce Utilities Authority through an inter-local agreement expiring in 2028. The County plans to serve the bulk demand and additional demand using the FAS.

Population and Finished Water Demand							
				Existing	Projected		
				2019	2025	2035	2045
Population				14,883	19,517	49,022	56,544
Average 2015-2019 Per Capita (gallons per day finished water)				72			
Potable Water Demands (daily average annual finished water in mgd)				1.07	1.41	3.53	4.07
SFWMD Water Use Permitted Allocation (mgd)							
Potable Water Source				Permit Number 56-00406-W (expires 2028)			
SAS				0.17			
FAS				6.65			
Bulk Raw Water Purchase (from Fort Pierce Utilities Authority)				1.01			
Total Allocation (excluding bulk water purchase)				6.82			
FDEP Potable Water Treatment Capacity (PWS ID # 4561689)							
Permitted Capacity by Source				Cumulative Facility & Project Capacity (mgd)			
				Existing		Projected	
				2019	2025	2035	2045
SAS				0.29	0.29	0.00 ^a	0.00 ^a
FAS				0.00	0.00	10.00	12.00
Total Potable Capacity				0.29	0.29	10.00	12.00
Nonpotable Alternative Water Source Capacity (mgd)							
Reclaimed Water ^b				2.75	2.75	4.75	6.75
Total Nonpotable Capacity				2.75	2.75	4.75	6.75
Project Summary							
Water Supply Project	Source	Completion Date	Total Capital Cost (\$ million)	Projected Cumulative Design Capacity (mgd)			
				2025	2035	2045	
Potable Water							
North County WTP, 2.00 mgd RO (2026-2027) and expansion by 2.00 mgd (2031-2032)	FAS	2026-2032	\$46.00	0.00	4.00	4.00	
Central County WTP, 2.00 mgd RO (2030) and expansion by 2.00 mgd (2040) to 4.00 mgd	FAS	2030-2040	\$46.00	0.00	2.00	4.00	
South County WTP, 2.00 mgd RO (2030) and expansion by 2.00 mgd (2035) to a total of 4.00 mgd	FAS	2030-2035	\$46.00	0.00	4.00	4.00	
Total Potable Water			\$138.00	0.00	10.00	12.00	
Nonpotable Water							
North County WWTF, 2.00 mgd WWTF (2026-2027) and expansion by 2.00 mgd (2036-2037) to a total of 4.0 mgd	Reclaimed	2026-2037	\$50.00	0.00	2.00	4.00	
Total Nonpotable Water			\$50.00	0.00	2.00	4.00	
Total New Water			\$188.00	0.00	12.00	16.00	

^a Holiday Pines WTP and WWTF will be replaced by the North County WTP and WWTF in 2025.

^b Total of three WWTFs: North (Holiday Pines) (FLA013969), 0.30 mgd; North Hutchinson Island (FLA013946), 0.85 mgd; and South Hutchinson Island (FL0139475), 1.60 mgd. Holiday Pines is to be decommissioned when the proposed North County WWTF comes online.

ST. LUCIE WEST SERVICES DISTRICT

Service Area: The St. Lucie West development located within the City of Port St. Lucie

Description: Potable water supplies are obtained from one FAS wellfield, treated at one WTP using RO. Up to 0.30 mgd of bulk potable water is provided to the Reserve Community Development District through 2024 with automatic 5-year renewals.

Population and Finished Water Demand							
				Existing	Projected		
				2019	2025	2035	2045
Population				13,785	13,785	13,785	13,785
Average 2015-2019 Per Capita (gallons per day finished water)				122			
Potable Water Demands (daily average annual finished water in mgd)				1.68	1.68	1.68	1.68
Bulk Potable Water Demands (daily average annual finished water in mgd delivered directly to the Reserve Community Development District)				0.30	0.30	0.30	0.30
Total Potable Water Demands (daily average annual finished water in mgd)				1.98	1.98	1.98	1.98
SFWMD Water Use Permitted Allocation (mgd)							
Potable Water Source				Permit Number 56-00614-W (expires 2039)			
SAS				0.00			
FAS				3.10			
Total Allocation				3.10			
FDEP Potable Water Treatment Capacity (PWS ID # 4565030)							
Permitted Capacity by Source				Cumulative Facility & Project Capacity (mgd)			
				Existing	Projected		
				2019	2025	2035	2045
SAS				0.00	0.00	0.00	0.00
FAS				3.40	3.40	3.40	3.40
Total Potable Capacity				3.40	3.40	3.40	3.40
Nonpotable Alternative Water Source Capacity (mgd)							
Reclaimed Water				2.13	2.13	2.13	2.13
Total Nonpotable Capacity				2.13	2.13	2.13	2.13
Project Summary							
Water Supply Project	Source	Completion Date	Total Capital Cost (\$ million)	Projected Cumulative Design Capacity (mgd)			
				2025	2035	2045	
Potable Water							
No Projects							
Total Potable Water			\$0.00	0.00	0.00	0.00	
Nonpotable Water							
No Projects							
Total Nonpotable Water			\$0.00	0.00	0.00	0.00	
Total New Water			\$0.00	0.00	0.00	0.00	

ST LUCIE

UTILITIES SERVING LOCAL GOVERNMENTS

Table B-2 identifies the local governments within the UEC Planning Area served by PS utilities with treatment capacity and water use of 0.10 mgd or greater. The first column in **Table B-2** lists the name of the local government, the second column notes whether that government owns and operates its own utility, and the third column identifies the local government(s) or private PS utility, or utilities, providing gross (raw) or net (finished) water to the local government. **Table B-3** identifies the PS utilities providing gross (raw) or net (finished) water to local governments within the UEC Planning Area. The first column of **Table B-3** lists the name of the PS utility, the second column notes whether that utility is owned and operated by a local government, and the third column identifies the incorporated and unincorporated areas of the UEC Planning Area that PS utility serves.

Table B-2. Local governments and the utilities and entities that serve them within the UEC Planning Area.

Local Government	Local Government Owned Utility	Other Utilities Serving Local Government
Martin County		
Indiantown, Village of	Yes	N/A
Jupiter, Town of ^a	Yes	N/A
Jupiter Island, Town of	Yes	South Martin Regional Utility (owned by Town of Jupiter Island)
Martin County (unincorporated)	Yes	South Martin Regional Utility, City of Stuart, Town of Jupiter, and Village of Tequesta, City of Port St. Lucie
Ocean Breeze, Town of	No	Martin County Utilities
Sewall's Point, Town of	No	Martin County Utilities
Stuart, City of	Yes	Martin County Utilities
Tequesta, Village of ^a	Yes	N/A
St. Lucie County		
Fort Pierce, City of	Yes	N/A
Port St. Lucie, City of	Yes	St. Lucie West Services District
St. Lucie County (unincorporated)	Yes	Fort Pierce Utilities Authority, Reserve Community Development District
St. Lucie Village	No	Fort Pierce Utilities Authority
Okeechobee County		
Okeechobee County ^b (unincorporated)	No	N/A

^a The Town of Jupiter and Village of Tequesta have utility service areas in both Martin and Palm Beach counties. This plan update only includes the portions located within Martin County. The *2018 Lower East Coast Water Supply Plan Update* (SFWMD 2018) addresses the utilities in their entirety, including population and water demand data, for Martin and Palm Beach counties.

^b Utilities in Okeechobee County are addressed in the *2019 Lower Kissimmee Basin Water Supply Plan Update* (SFWMD 2019). Presently, there are no utilities in the northeastern portion of Okeechobee County within the UEC Planning Area boundary.

Table B-3. Utilities and local governments that serve the UEC Planning Area.

Utility/Entity Name	Local Government Utility	Local Governments Served
Martin County		
Indiantown, Village of	Yes	Village of Indiantown
Jupiter, Town of ^a	Yes	Unincorporated Martin County
Martin County Utilities	Yes	Unincorporated Martin County, City of Stuart, Town of Ocean Breeze, Town of Sewall's Point, City of Fort Pierce, and Floridian Golf Resort (located in St. Lucie County)
Port St. Lucie, City of	Yes	Unincorporated Martin County (serving Martin Correctional Institution)
Sailfish Point	No	Unincorporated Martin County (serving Sailfish Point development)
South Martin Regional Utility	Yes	Town of Jupiter Island and unincorporated Martin County (including Hobe Sound)
Stuart, City of	Yes	City of Stuart and unincorporated Martin County
Tequesta, Village of ^a	Yes	Unincorporated Martin County
St. Lucie County		
Fort Pierce Utilities Authority	Yes	City of Fort Pierce, St. Lucie Village, and bulk water to St. Lucie County Utilities
Harbour Ridge	No	Unincorporated St. Lucie County (serving Harbour Ridge Country Club)
Meadowood Community Association	No	Unincorporated St. Lucie County (serving Meadowood)
Port St. Lucie Utility Systems Department, City of	Yes	City of Port St. Lucie, unincorporated Martin County, and St. Lucie County
Reserve Community Development District	No	Unincorporated St. Lucie County (serving a portion of The Reserve development)
Spanish Lakes Country Club	No	Unincorporated St. Lucie County (serving Spanish Lakes Country Club Village)
Spanish Lakes Fairways	No	Unincorporated St. Lucie County (serving Spanish Lakes Fairways)
St. Lucie County Utilities District	Yes	Unincorporated St. Lucie County
St. Lucie West Services District	No	City of Port St. Lucie (serving St. Lucie West development and The Reserve development)

^a The Town of Jupiter and Village of Tequesta have utility service areas in both Martin and Palm Beach counties. This plan update only includes the portions located within Martin County. The 2018 Lower East Coast Water Supply Plan Update (SFWMD 2018) addresses these utilities in their entirety, including population and water demand data, for Martin and Palm Beach counties.

REFERENCES

- FDEP. 2020a. *2019 Reuse Inventory*. Water Reuse Program, Florida Department of Environmental Protection, Tallahassee, FL.
- FDEP. 2020b. *Flow Data and Treatment Data from the Drinking Water Database*. Florida Department of Environmental Protection, Tallahassee, FL. Available from: <https://floridadep.gov/water/source-drinking-water/content/information-drinking-water-data-base>.
- SFWMD. 2018. *2018 Lower East Coast Water Supply Plan Update*. South Florida Water Management District, West Palm Beach, FL.
- SFWMD. 2019. *2019 Lower Kissimmee Basin Water Supply Plan Update*. South Florida Water Management District, West Palm Beach, FL.
- Tetra Tech. 2019. *City of Port St. Lucie McCarty Ranch Water Supply Plan*. Final Report. Presented to City of Port St. Lucie. Tt No.: 200-08501-17001. Tetra Tech, Orlando, FL. September 5, 2019. 388 pp.

C

St. Lucie Estuary MFL and Prevention Strategy

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The South Florida Water Management District (SFWMD or District) adopts minimum flows and minimum water levels (MFLs) to protect water supplies for natural systems. In the Upper East Coast (UEC) Planning Area, the SFWMD has adopted an MFL for the St. Lucie Estuary [Rule 40E-8.341, Florida Administrative Code (F.A.C.)] (**Figure C-1**). The MFL criteria and prevention strategy adopted for the St. Lucie Estuary are discussed in this appendix. The MFLs and recovery strategies for Lake Okeechobee and the Northwest Fork of the Loxahatchee River affect portions of the UEC Planning Area but are included in the Lower East Coast water supply plan updates. Further information on MFLs and recovery and prevention strategies can be found in the *Support Document for the 2021-2024 Water Supply Plan Updates* (2021-2024 Support Document; SFWMD 2021).

ST. LUCIE ESTUARY

MFL Criteria

Subsection 40E-8.021(29), F.A.C., defines the St. Lucie Estuary (**Figures C-1 and C-2**), as the surface water body south of the confluence of the St. Lucie River North Fork and the C-24 Canal; north of the confluence of the St. Lucie River South Fork and the C-44 Canal; and west of the western boundary of the Intracoastal Waterway, exclusive of canals.

In 2002, the SFWMD adopted MFL criteria for the St. Lucie Estuary (Subsection 40E-8.341, F.A.C.). The criteria are intended to protect the estuary's valued ecosystem components from significant harm (as defined in Rule 40E-8.021, F.A.C.). A valued ecosystem component can be a species, community, or set of environmental conditions and associated biological communities that are critical to maintaining the integrity of an ecosystem. The valued ecosystem components identified for the St. Lucie Estuary include organisms inhabiting the oligohaline zone (i.e., submerged aquatic vegetation, phytoplankton, zooplankton, macroinvertebrates, and larval and juvenile fish and shellfish).

The MFL criteria for the St. Lucie Estuary are based on the determination that significant harm occurs to the oligohaline zone of the estuary when net freshwater flows to the estuary are reduced. This can occur when freshwater deliveries to the North Fork of the St. Lucie River decline substantially. To ensure adequate freshwater deliveries to the North Fork and the downstream estuary, a minimum mean monthly flow criterion of 28 cubic feet per second (cfs) at the Gordy Road structure (**Figure C-2**) was adopted as the MFL. An MFL exceedance occurs when this minimum flow criterion is not met. An MFL violation occurs when the mean monthly flow at the Gordy Road structure declines below 28 cfs for two consecutive months during a 365-day period for two consecutive years. Further details about the MFL for the St. Lucie Estuary and information on all MFLs and recovery and prevention strategies adopted in the SFWMD can be found in Chapter 40E-8, F.A.C., and on the SFWMD website at www.sfwmd.gov/mfls.

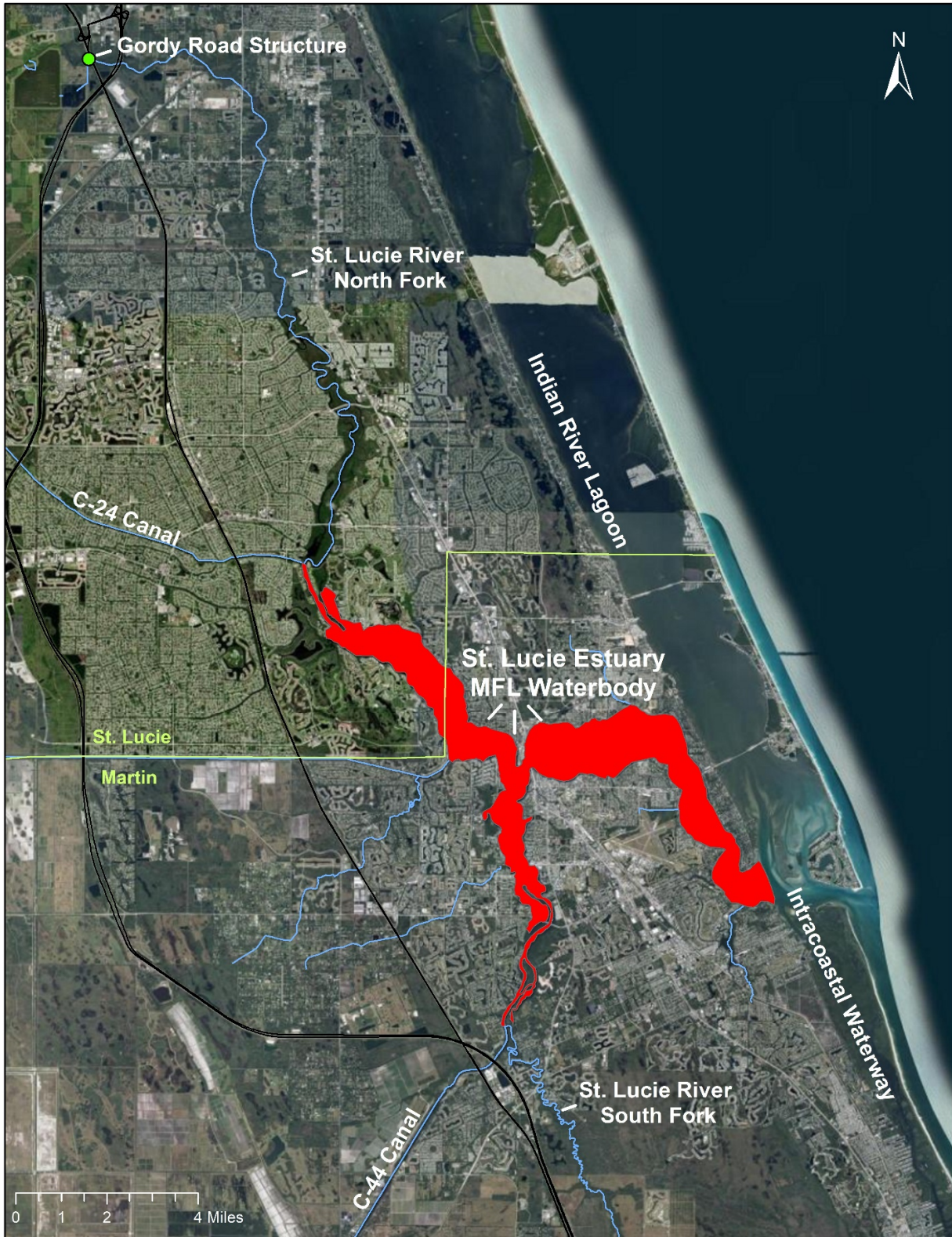


Figure C-2. St. Lucie Estuary minimum flow and minimum water level waterbody.

Prevention Strategy

A prevention strategy for the St. Lucie Estuary [Subsection 40E-8.421(5), F.A.C.] was adopted simultaneously with the MFL rule to minimize the likelihood that a violation of the estuary's MFL criteria would occur in the future. Based on an evaluation of future demands associated with this MFL water body, the MFL criteria are not anticipated to be exceeded in the next 20 years. The prevention strategy for the St. Lucie Estuary consists of the following major components:

- ◆ Discharges from the North Fork will be managed within the operational protocols of the Ten Mile Creek Project. Flow targets will be consistent with the Comprehensive Everglades Restoration Plan (CERP) performance requirements for Indian River Lagoon.
- ◆ A research and monitoring strategy for the North and South Forks of the St. Lucie River will be implemented in coordination with the UEC water supply plan updates.

To meet the flow target component, the SFWMD is implementing the CERP Indian River Lagoon – South (IRL-S) Project, which is briefly described below and in more detail in **Chapter 7** of the plan update. Research and monitoring in the North and South Forks of the St. Lucie River also are discussed below. Additional details about the prevention strategy for the St. Lucie Estuary can be found at www.sfwmd.gov/mfls.

SFWMD Ten Mile Creek Project

The SFWMD Ten Mile Creek Project is in St. Lucie County near Fort Pierce, adjacent to Ten Mile Creek, which is a tributary to the North Fork of the St. Lucie River. The project's Water Preserve Area consists of a 526-acre reservoir and 132-acre stormwater treatment area (STA) (**Figure C-3**). Placed in operation in 2017, the Ten Mile Creek Project is designed to help control the quantity, quality, and timing of water deliveries to the St. Lucie River and Estuary. Excess water flowing over the Gordy Road structure is captured in the reservoir, then routed through the STA to improve the water quality, before being released back to Ten Mile Creek, which flows to the St. Lucie River. Approximately 2,500 acre-feet of water, or 815 million gallons, can be stored in the reservoir and sent through the project's wetlands before flowing back to Ten Mile Creek. Additional information about the SFWMD Ten Mile Creek Project is provided in **Chapter 7** of the plan update.

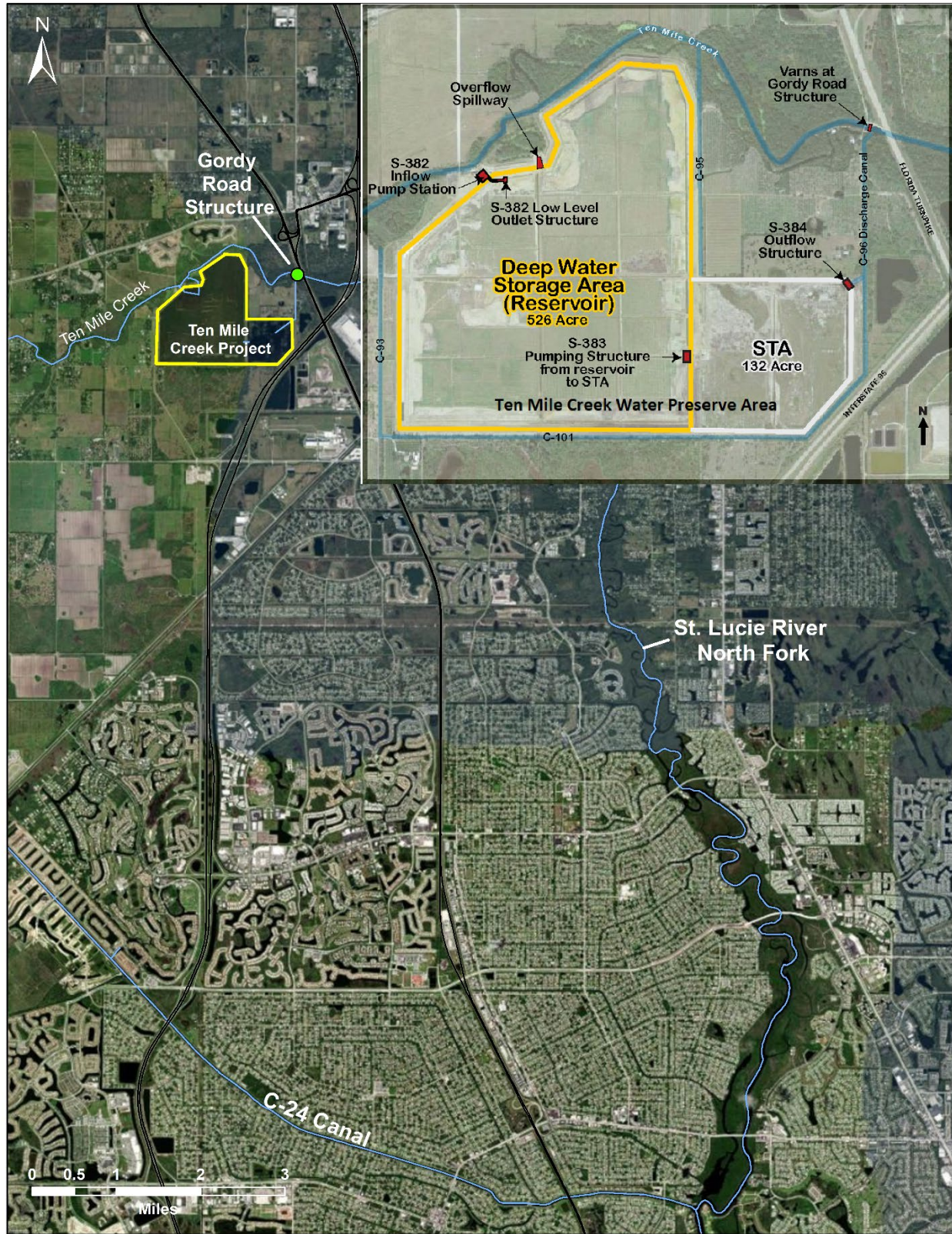


Figure C-3. Ten Mile Creek Project components.

CERP Indian River Lagoon – South Project

The CERP IRL-S Project will reduce freshwater inflows and generate habitat and water quality improvements in the St. Lucie Estuary and Indian River Lagoon. Structural changes proposed for the watershed are designed to provide additional retention basins (aboveground reservoirs), improved water conveyance facilities, and operational strategies within the watershed. The changes will capture, store, and attenuate excess water previously discharged directly to tide during the wet season. During the dry season, the captured water will be redistributed via its historical flow pathways to be discharged down the North and South Forks of the St. Lucie River to the St. Lucie Estuary and Indian River Lagoon. The objectives of the retention basins are to help reduce the volume and frequency of damaging freshwater discharges to the St. Lucie Estuary and restore a more natural volume, timing, and distribution of freshwater flow to the estuary, enhancing the opportunity for recovery from high water flows. The project may provide water supply for agriculture to offset reliance on the Floridan aquifer system. The following components of the CERP IRL-S Project are currently in design or construction (**Figure C-4**). These are discussed in more detail in **Chapter 7** of the plan update.

C-23/24 Basin Components:

- ◆ C-23/C-24 North and South Reservoirs and STA
- ◆ Cypress Creek/Trail Ridge Natural Storage and Water Quality Treatment Area
- ◆ Allapattah Natural Storage and Water Quality Treatment Area
- ◆ Northern and Southern Diversions of Existing Watershed Flows

C-25, North Fork, and South Fork Basin Components:

- ◆ C-25 Reservoir and STA
- ◆ North Fork Natural Floodplain Restoration Muck Remediation and Artificial Habitat
- ◆ South Fork Natural Storage and Water Quality Treatment Area

C-44 Basin Components:

- ◆ C-44 Reservoir and STA
- ◆ Pal-Mar Natural Storage and Water Quality Treatment Area

While all project components will support the MFL water body as a whole, the specific components below ensure the MFL will continue to be met at the MFL compliance point (Gordy Road structure):

- ◆ C-23/C-24 North Reservoir and STA
- ◆ Northern Diversion of Existing Watershed Flows
- ◆ North Fork Natural Floodplain Restoration Muck Remediation and Artificial Habitat

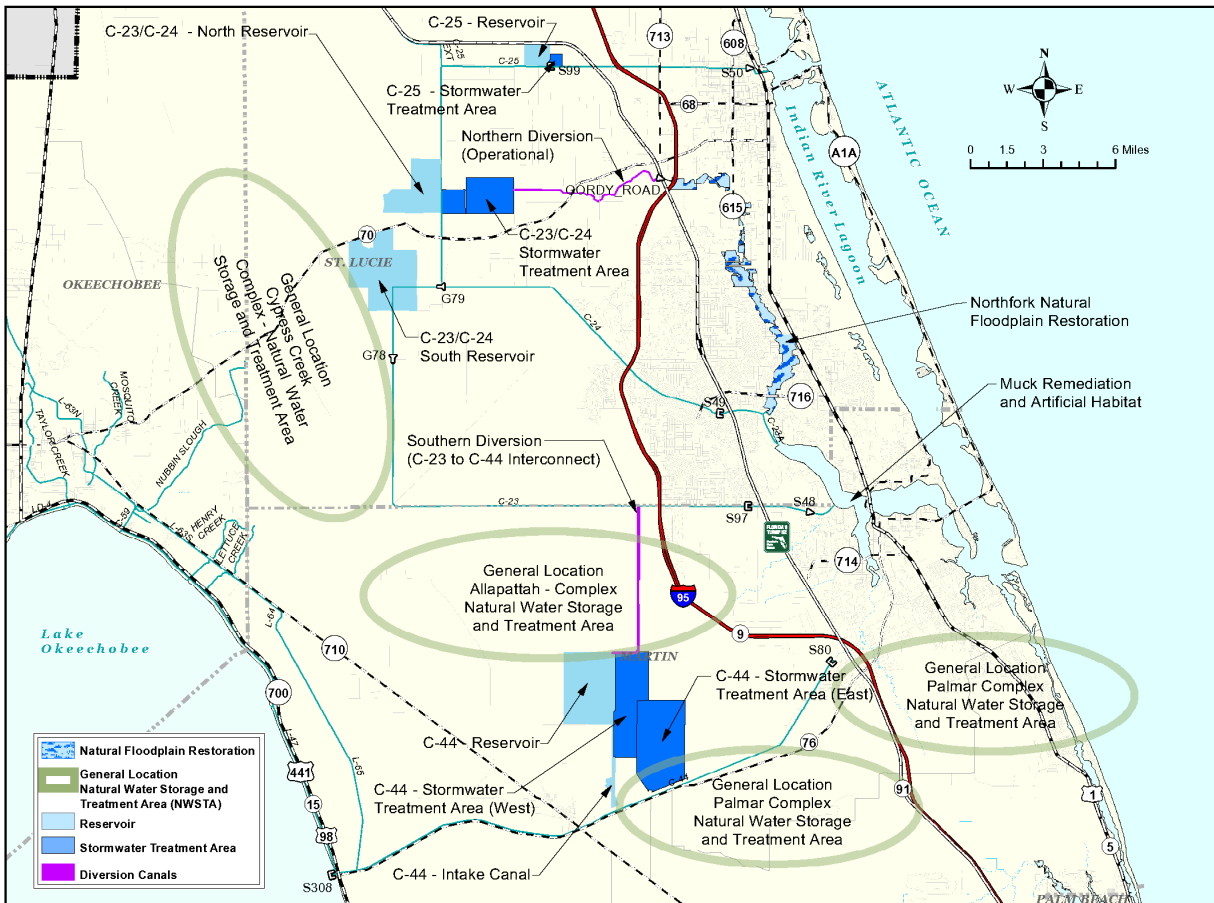


Figure C-4. Components of the CERP Indian River Lagoon – South Project.

Research and Monitoring in the North and South Forks

Depending on source and magnitude, inflows to the St. Lucie Estuary can affect water quality and ecological resources. Changes to natural water flow and water quality gradients within an estuary due to modified water management operations or other anthropogenic activities can impact the distribution and dynamics of many estuarine communities. To address such concerns, ongoing research and monitoring are conducted in the estuarine portions of the St. Lucie Estuary (North and South Forks of the St. Lucie River; **Figure C-5**), as outlined in Volume I – Chapter 8C, Part II of the *2021 South Florida Environmental Report* (Kahn et al. 2021). In brief, the research program monitors 1) salinity, 2) water quality, and 3) benthic habitats (oysters and seagrass). Surface and bottom salinity measurements are recorded every 15 minutes at three stations and averaged to produce a water column daily average time series. Water quality samples are collected monthly at 10 stations and tested for concentrations of chlorophyll a, total phosphorus, and total nitrogen. Salinity and water quality conditions are important considerations for the health of ecological indicator species, such as oysters and seagrasses, because excursions outside of tolerable ranges can lead to increased disease, predation rates, and even death (Parker and Radigan 2020).

Oysters are monitored in the St. Lucie Estuary as an indicator species for the CERP Restoration Coordination and Verification (RECOVER) program. Oyster density, disease prevalence and intensity, and juvenile recruitment have been continuously monitored at three stations in the North Fork and three stations in the South Fork since 2005. Density counts are collected biannually (in the spring and fall), while juvenile recruitment and disease prevalence and intensity are measured monthly. Seagrass habitats are assessed at two monitoring sites within the St. Lucie Estuary. During the wet season (May to October), seagrass monitoring occurs monthly; during the dry season, monitoring occurs in November, March, and April. Results of the monitoring program are published annually in the *South Florida Environmental Report*.



Figure C-5. St. Lucie Estuary monitoring locations for salinity (US1 and A1A), water quality (HR1, SE03, and SE11), oysters (SL-C sites), and seagrass (Willoughby Creek [WC] and St. Lucie Inlet [SLI]) (From: Kahn et al. 2021).

SUMMARY

- ◆ The adopted MFL criteria for the St. Lucie Estuary continue to be implemented in the UEC Planning Area and have not been modified since the 2016 UEC Plan Update.
- ◆ The St. Lucie Estuary MFL is being met at the compliance point (Gordy Road structure).
- ◆ Components of the MFL prevention strategy are being planned, constructed, or implemented to continue supporting the MFL.

REFERENCES

- Kahn, A., J. Hutchins, B. Welch, N. Gavin, D. Sun, and S. Setegn. 2021. Chapter 8C: St. Lucie River Watershed Protection Plan Annual Progress Report. In: *2021 South Florida Environmental Report* – Volume II. South Florida Water Management District, West Palm Beach, FL.
- Parker, M.L. and R. Radigan. 2020. *Oyster monitoring in the northern estuaries of the southeast coast of Florida 2005-2018*. Final report submitted under Contract #4600002548 to the South Florida Water Management District.
- SFWMD. 2018. *2018 Lower East Coast Water Supply Plan Update*. South Florida Water Management District, West Palm Beach, FL.
- SFWMD. 2021. *Support Document for the 2021-2024 Water Supply Plan Updates*. South Florida Water Management District, West Palm Beach, FL. November 2021.

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Groundwater Monitoring and Analysis

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Groundwater monitoring programs collect data to help guide operations, provide early warning of threats to water supply, protect existing users and natural systems, and support regional surface water and groundwater models. Monitoring programs associated with environmental restoration are identified in **Chapter 7**, and monitoring results can be found in the annual updates of the *South Florida Environmental Report* (SFER). Historical and current hydrologic, meteorologic, hydrogeologic, and water quality data for the 16 counties within the South Florida Water Management District (SFWMD or District) are available through the SFWMD's corporate environmental database, DBHYDRO.

Several sources of groundwater data were reviewed during development of this *2021 Upper East Coast Water Supply Plan Update* (2021 UEC Plan Update), including the following:

- ◆ Hydrologic data from monitoring wells in the surficial and Floridan aquifer systems (SAS and FAS)
- ◆ Saltwater interface monitoring data and maps
- ◆ Results of the updated East Coast Floridan Model (ECFM)

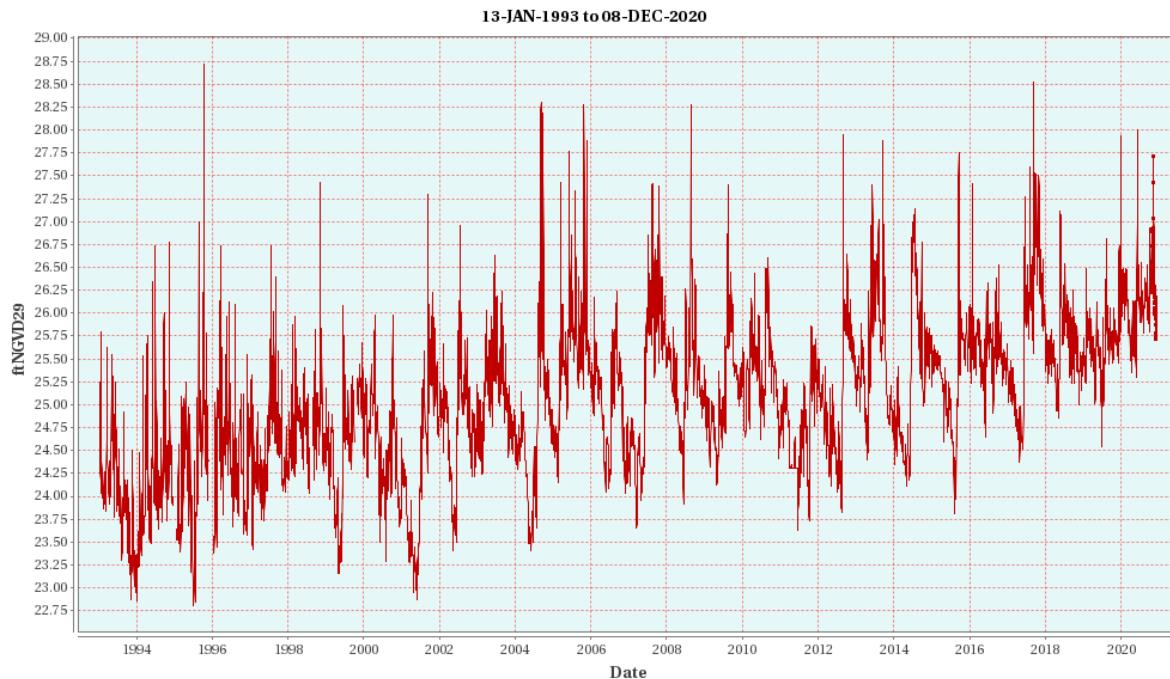
Chapter 6 provides an assessment of historical and current conditions of the region's water resources using water availability and hydrologic data (e.g., water level, water quality) from surface water and groundwater (SAS and FAS) monitoring sites throughout the UEC Planning Area. Additional monitoring data and maps in the chapter show the current location of the saltwater interface in relation to water supply sources. This appendix provides information on current and predicted future conditions, including the following:

- ◆ Supplemental SAS and FAS water level hydrographs
- ◆ Climate change and sea level rise
- ◆ Utilities vulnerable to saltwater intrusion during dry periods
- ◆ ECFM simulation results for 2019 and 2045 demands

SUPPLEMENTAL GROUNDWATER HYDROGRAPHS

Hydrographs show changes in water levels over time. Numerous hydrographs were generated from monitor well data to determine trends in groundwater levels within the UEC Planning Area. Seasonal fluctuations in SAS and FAS water levels were present; however, no notable upward or downward trend in water levels was evident over the available period of record. Hydrographs for selected monitor wells in Martin and St. Lucie counties that are considered representative of regional conditions are presented and discussed in **Chapter 6**. Additional hydrographs are provided in this section (**Figures D-1 to D-7**). Further details about these monitor wells can be found in **Chapter 6**, Tables 6-1 and 6-3.

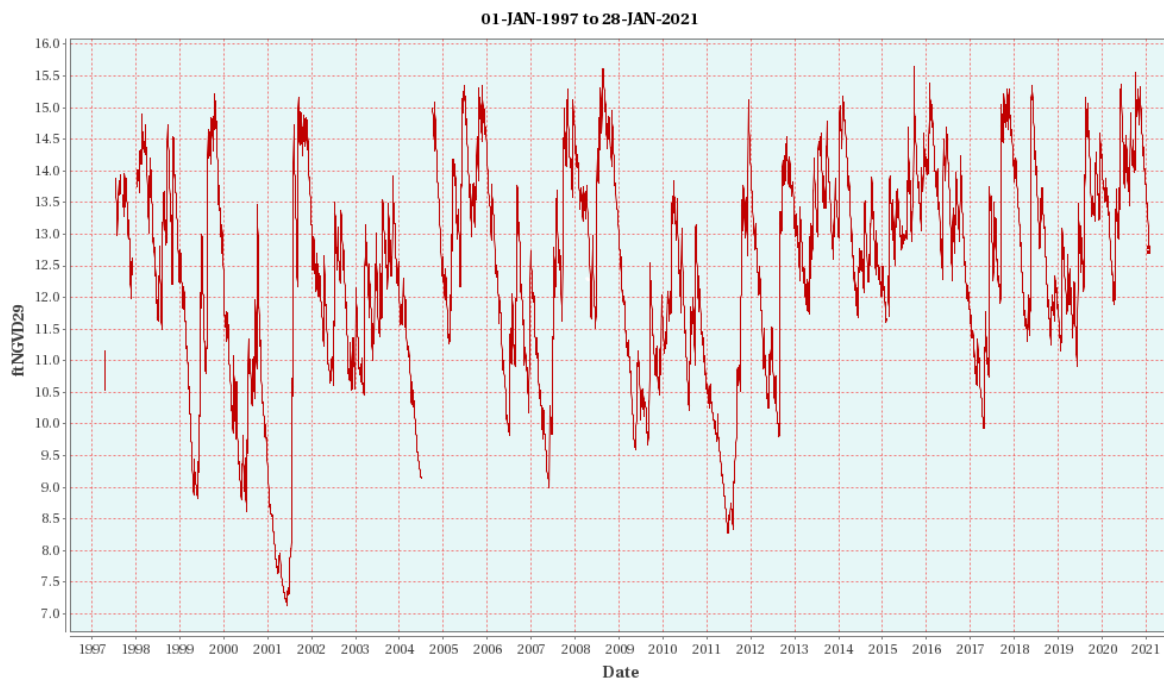
Figures D-1 to D-5 present hydrographs for SAS monitor wells. Overall, groundwater levels in the SAS appear stable and none show trends indicating water supply is being negatively affected.



Provisional data, if present, are indicated by square symbol.

DBKey	Station	Agency	Data Type	Unit	Statistic	Frequency	Strata	Gate/Pump#
— LP686	M-1255	USGS	WELL	ft NGVD29	MAX	DA	35	N/A

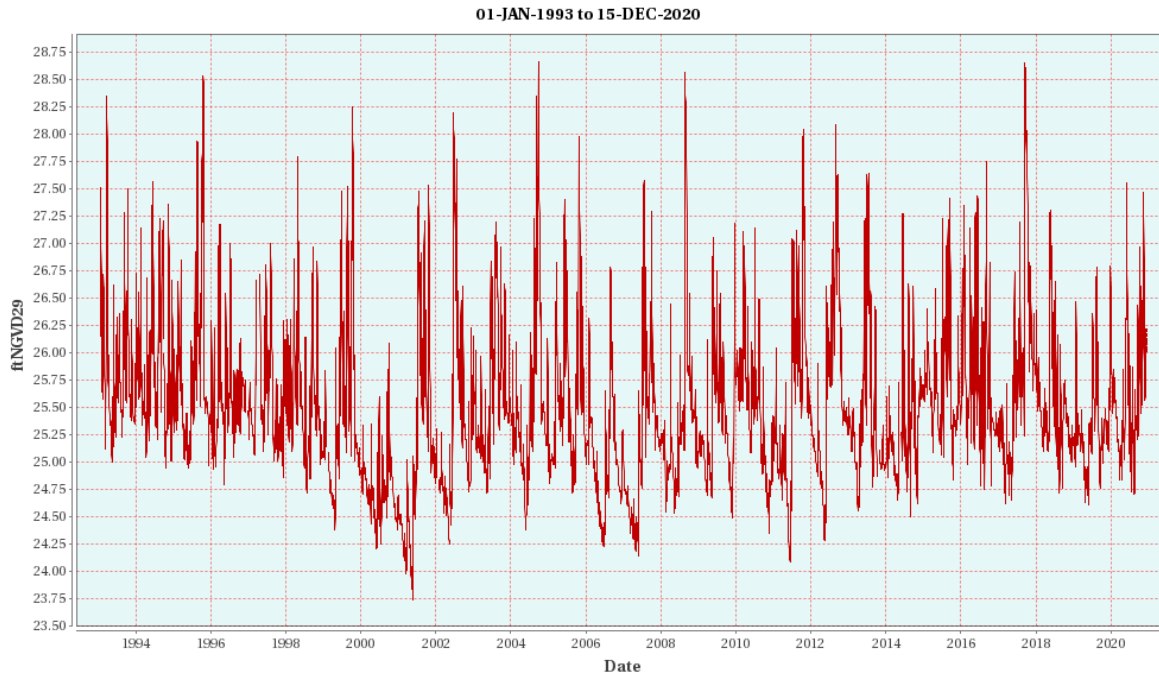
Figure D-1. Water levels in surficial aquifer system monitor well M-1255, northwestern Martin County.



Provisional data, if present, are indicated by square symbol.

DBKey	Station	Agency	Data Type	Unit	Statistic	Frequency	Strata	Gate/Pump#
— FI275	SAV4-GW	WMD	WELL	ft NGVD29	MEAN	DA	22.5	N/A

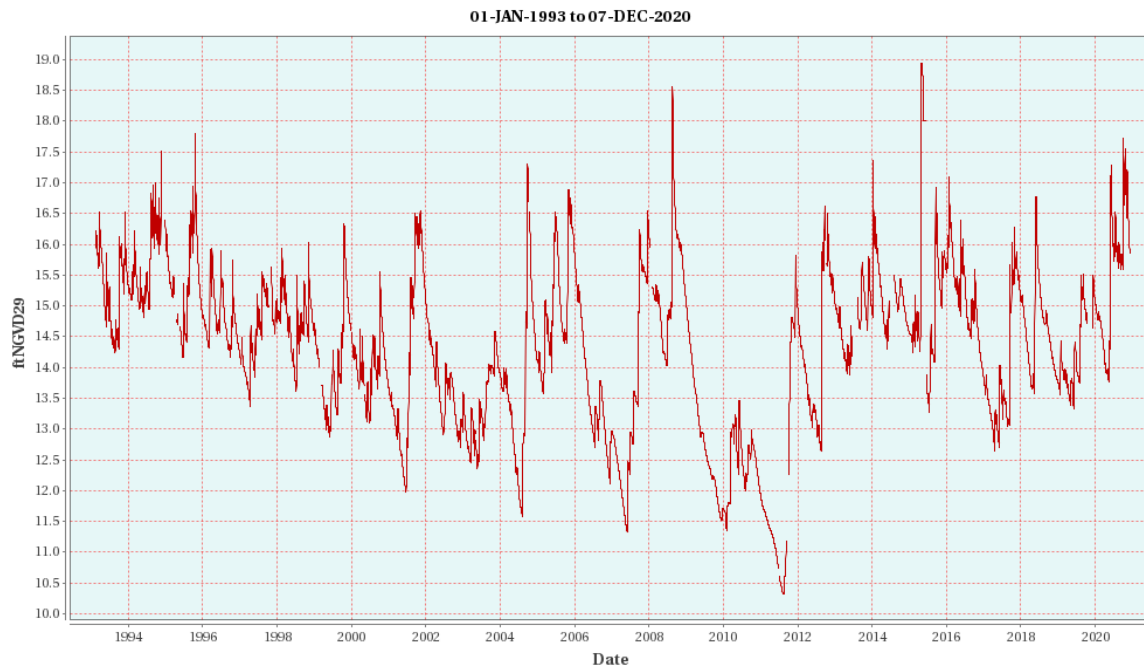
Figure D-2. Water levels in surficial aquifer system monitor well SAV4-GW, northeastern coastal Martin County.



Provisional data, if present, are indicated by square symbol.

DBKey	Station	Agency	Data Type	Unit	Statistic	Frequency	Strata	Gate/Pump#
03226	STL-42	USGS	WELL	ft NGVD29	MAX	DA	18	N/A

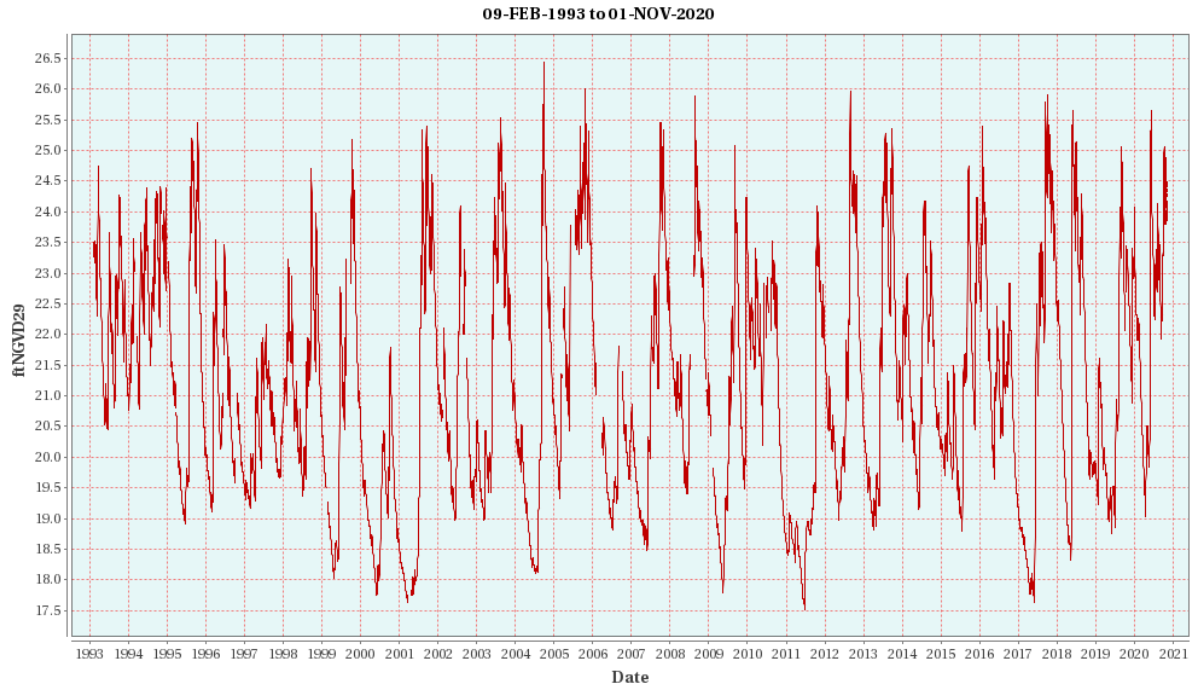
Figure D-3. Water levels in surficial aquifer system monitor well STL-42, northwestern St. Lucie County.



Provisional data, if present, are indicated by square symbol.

DBKey	Station	Agency	Data Type	Unit	Statistic	Frequency	Strata	Gate/Pump#
03164	STL-176	USGS	WELL	ft NGVD29	MAX	DA	30	N/A

Figure D-4. Water levels in surficial aquifer system monitor well STL-176, southeastern coastal St. Lucie County.

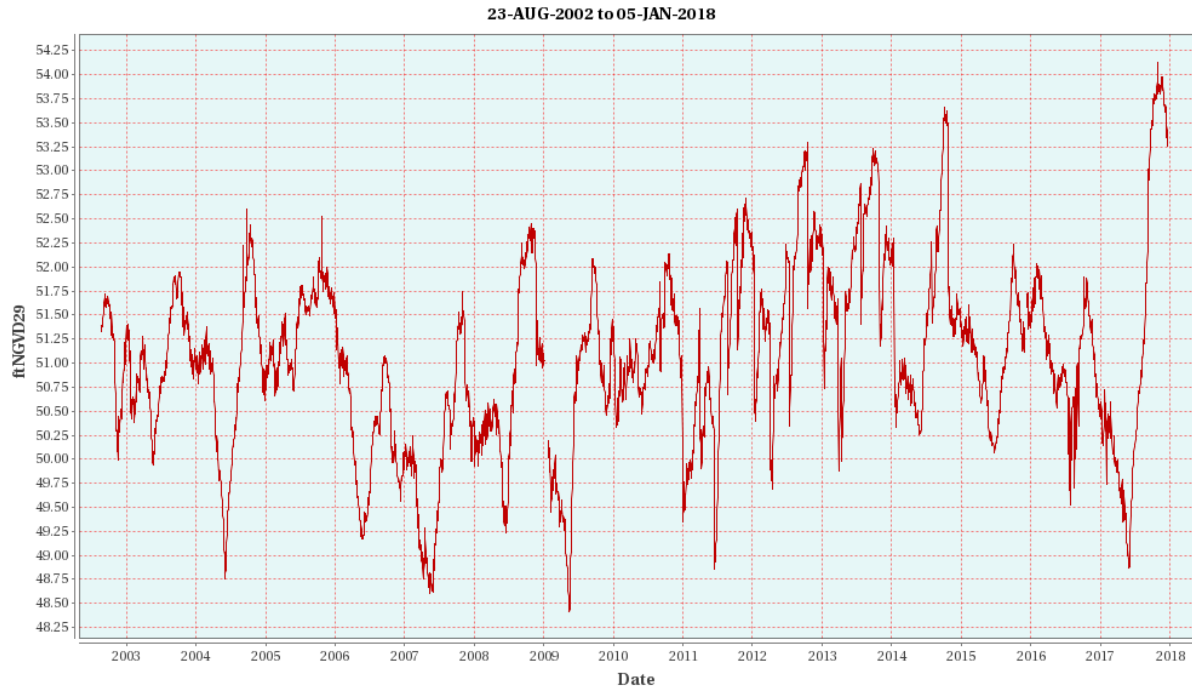


Provisional data, if present, are indicated by square symbol.

DBKey	Station	Agency	Data Type	Unit	Statistic	Frequency	Strata	Gate/Pump#
LP687	STL-214	USGS	WELL	ft NGVD29	MAX	DA	70	N/A

Figure D-5. Water levels in surficial aquifer system monitor well STL-214, south central St. Lucie County.

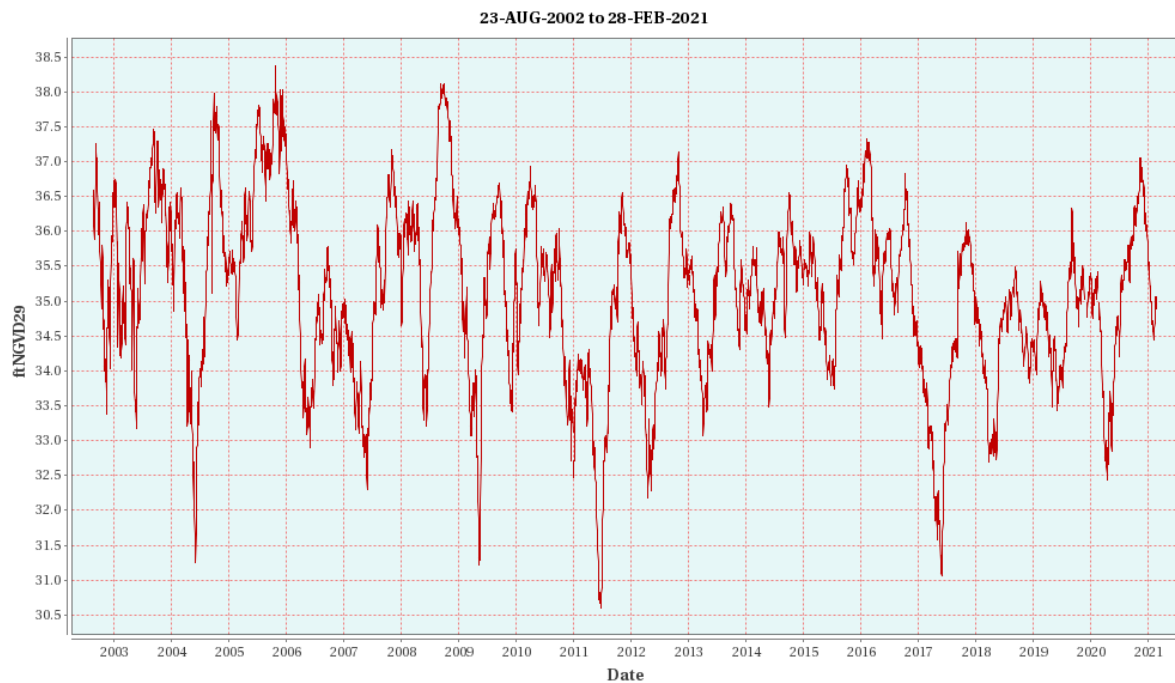
Figures D-6 and D-7 present hydrographs for FAS monitor wells. There are seasonal variations in water levels in the FAS; however, there is no apparent significant upward or downward trend.



Provisional data, if present, are indicated by square symbol.

DBKey	Station	Agency	Data Type	Unit	Statistic	Frequency	Strata	Gate/Pump#
OB389	MF-52	WMD	UNHD	ft NGVD29	MEAN	DA	1320	N/A

Figure D-6. Water levels in Floridan aquifer system monitor well MF-52, central Martin County.



Provisional data, if present, are indicated by square symbol.

DBKey	Station	Agency	Data Type	Unit	Statistic	Frequency	Strata	Gate/Pump#
SP555	SLF-21	WMD	UNHD	ft NGVD29	MEAN	DA	707	N/A

Figure D-7. Water levels in Floridan aquifer system monitor well SLF-21, north central St. Lucie County.

CLIMATE CHANGE AND SEA LEVEL RISE

Observed Effects

The combination of sea level rise and changes in temperature, rainfall patterns, and tropical storm activity is altering how the SFWMD achieves its mission elements to safeguard and restore South Florida's water resources and ecosystems, protect communities from flooding, and meet the region's water needs. The SFWMD's resiliency approach focuses on 1) understanding the impacts climate change may have on water resources and future water supply sources, and 2) determining how to respond while achieving the agency's mission elements through planning, proactive action, and adaptive management.

Air Temperature Rise, Precipitation Regimes, and Storm Frequency

Current predictions, from multiple climate models summarized by the Intergovernmental Panel on Climate Change (2013), indicate temperature will rise between 2.5°F and 10°F over the next century. Warmer air temperatures will increase evaporation, resulting in lower surface water levels (e.g., in lakes, canals, rivers), increased irrigation demands, and impacts to stormwater runoff, soil moisture, groundwater recharge, and water quality. Additionally, increased air temperatures contribute to sea level rise through thermal expansion of ocean waters and through glacial melt releasing large volumes of water into the oceans.

According to The Climate Explorer (2021), the average daily maximum temperature for St. Lucie County is projected to increase from approximately 85°F during the 2020s to nearly 87°F in 2045 (**Figure D-8**).

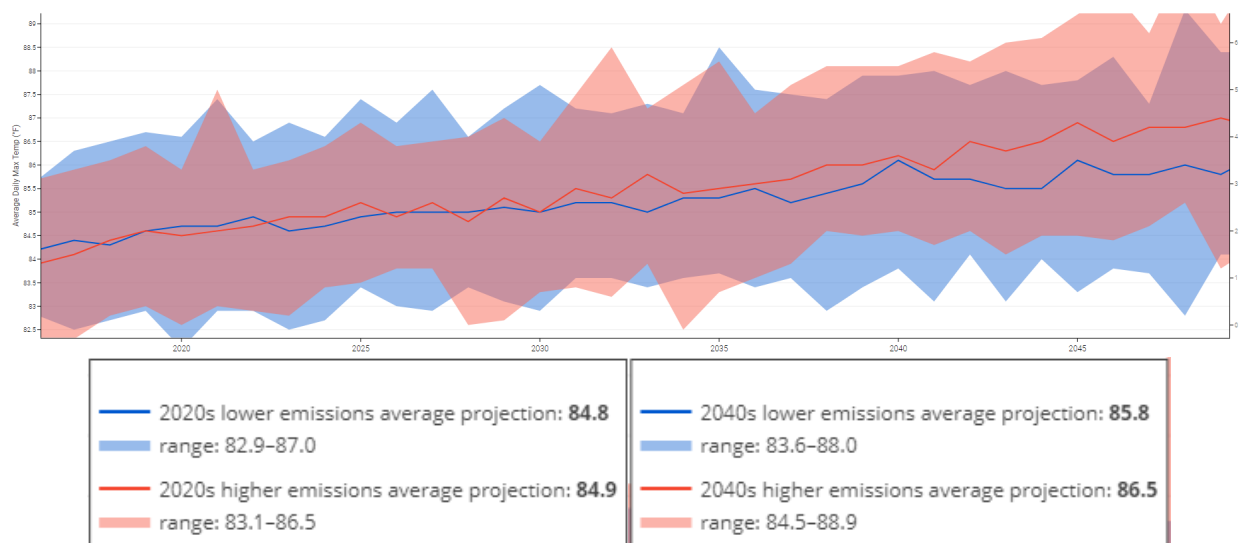


Figure D-8. Projected average daily maximum temperature in St. Lucie County, Florida (From: The Climate Explorer 2021).

More frequent, intense rainfall events with longer interim dry periods could increase total annual rainfall but decrease effective rainfall (i.e., aquifer recharge) as more water may be lost to runoff, prompting the need for storage alternatives. In addition, longer interim dry periods could increase the need for supplemental irrigation of agricultural crops and landscaped areas. Climate models for Florida currently do not present a clear trend for projected rainfall. Additional studies by the United States Geological Survey are under way to determine more precise estimates of future rainfall conditions. A final report of the results is expected in September 2022.

Several ongoing research studies are focusing on the implications of future temperature changes on evapotranspiration losses. The SFWMD has conducted and commissioned studies on the predictive skills of climate models and has downscaled larger models for application specific to Florida. Efforts to improve climate prediction models are under way, and the SFWMD will incorporate the improved models into planning and operations, as appropriate.

Sea Level Rise

The effects of rising sea levels are most easily observed when water overtops seawalls and floods urban areas during seasonal high tides. Higher sea levels also contribute indirectly to flooding by increasing groundwater levels and decreasing the capacity of the drainage network. As groundwater levels rise, soil storage capacity, which typically helps minimize flooding after rain events, is reduced.

In general, water levels in South Florida canals are maintained lower than land surface so they can drain the surrounding areas in response to heavy rains. Coastal canals stages are maintained higher than sea level to prevent saltwater from moving inland. If canal water levels cannot be maintained higher than sea level, then salinity control structures are closed to prevent entry of saltwater into fresh surface water bodies. More frequent structure closures due to higher sea levels can lead to increased risk for flooding and need for flood control modifications. There are four coastal structures (S-48, S-49, S-50, and S-80) in the UEC Planning Area. The upstream stages at these structures are maintained above 10 feet National Geodetic Vertical Datum of 1929 (NGVD29), and minimal effects from sea level rise are expected through the planning horizon.

Rising seas also can impact South Florida's drinking water supplies. As the rate of sea level rise increases, inland movement of the saltwater interface could accelerate. As sea level continues to rise, saltwater intrusion may require some coastal wellfields in the UEC Planning Area be relocated farther inland, change treatment processes, or be replaced by alternative water sources.

The current rate of sea level rise is expected to accelerate in the future. In 2019, the Southeast Florida Regional Climate Compact updated its Unified Sea Level Rise Projections, which can be used to estimate future potential sea level elevations in southeastern Florida and the relative change in sea level from today to a point in the future (**Figure D-9**). Based on the Southeast Florida Regional Climate Compact's (2019) intermediate/low and high projections, sea level is estimated to increase in southeastern Florida between 9 and 16 inches over the planning horizon (2019 to 2045).

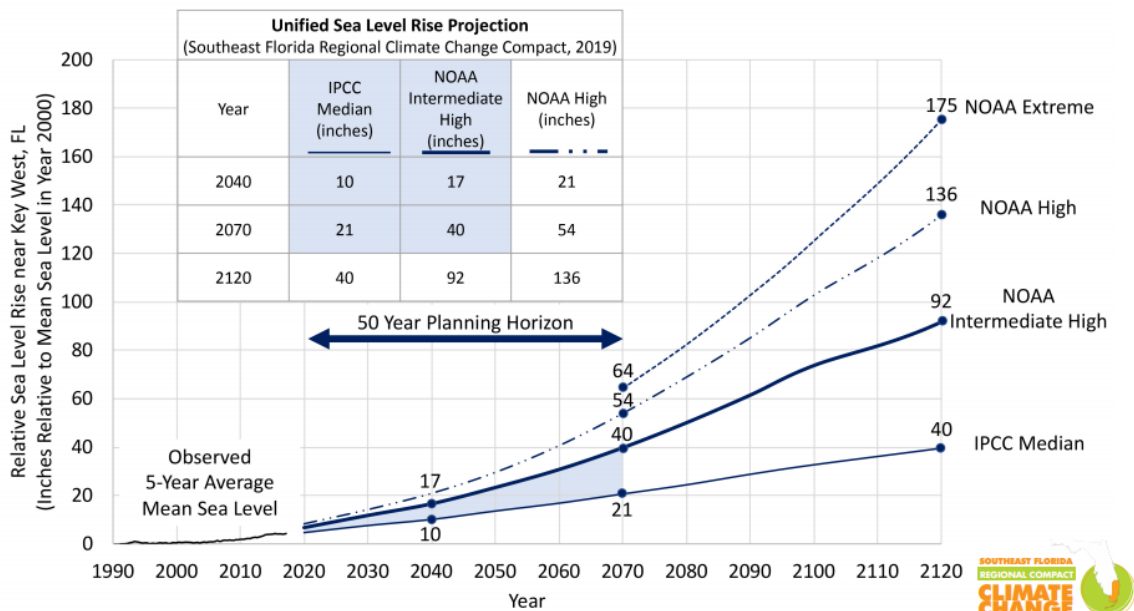


FIGURE 1: Unified Sea Level Rise Projection

Figure D-9. Most recent unified southeastern Florida sea level rise projection for regional planning purposes (From: Southeast Florida Regional Climate Change Compact 2020).

The unified sea level rise projection for southeastern Florida is intended to be used for regional planning purposes when considering sea level rise over short- and long-term planning horizons and in infrastructure design. The “NOAA High” curve shown in **Figure D-9** is meant to be used for long-term (50 years or more) and/or high-risk (e.g., nuclear power plants) projects, for which potential impacts from sea level rise could cause significant damage and/or loss of life. Most regional and local planners should use the projection in the shaded blue area of **Figure D-9**, although using the high end of this area will be more conservative and provide an additional level of protection.

In response to observed and projected sea level rise, the SFWMD is actively monitoring and mapping the location of the saltwater interface within coastal freshwater aquifers. Completed every 5 years, the saltwater interface mapping effort identifies any movement of saltwater inland, which can put water supply at risk. Increased chloride levels can impact water supply operations and ecosystems. **Chapter 6** provides further information on the saltwater interface mapping effort and the most recent map of the estimated position of the saltwater interface in Martin and St. Lucie counties.

Current Management Strategies

The SFWMD has been evaluating climate change and sea level rise since 2008 to determine the best short- and long-term strategies for water resource management and to prepare for related impacts (SFWMD 2009a, 2011). Long-established networks of rainfall and surface water flow data, many with real-time electronic reporting, provide continuous data to monitor changes in local hydrology. In addition, an extensive network of coastal and inland surface water and groundwater monitoring sites collect water level and quality data, including information about saltwater intrusion.

The SFWMD recently began developing a set of water and climate resiliency metrics to track and document shifts and trends in observed data. The resiliency metrics effort will support assessment of current and future climate condition scenarios and related operational decisions, and it will inform SFWMD resiliency investment priorities. As part of the SFWMD's communication and public engagement priorities, this effort also will inform stakeholders, the general public, and partner agencies about the SFWMD's resiliency activities, while supporting local resiliency strategies.

Future water supply and stormwater management analyses require the use of rainfall pattern estimates. Currently, this area of climate science is lagging in Florida, and there is no consistent information on how future rainfall patterns may change in South Florida. The SFWMD, in coordination with the United States Geological Survey and academia, is developing future rainfall intensity-duration-frequency scenarios, rainfall probability analyses, and extreme weather events projections. An ensemble method is being applied to determine median change factors as well as variability (model spread) at each National Oceanic and Atmospheric Administration Atlas station, of which three are located within the UEC Planning area (Stuart, Port St. Lucie, and Fort Pierce). Results will 1) help the SFWMD manage drainage and water supply protection infrastructure by providing an evaluation of predicted rainfall and runoff, and 2) lead to more accurate simulations of effects of rainfall extremes and other meteorologic factors.

Data from coastal monitor wells are being used to calibrate advanced groundwater models designed to support the evaluation of sea level rise and climate change scenarios and simulate future saltwater inland movement. The East Coast Surficial Model, encompassing the UEC and Lower East Coast planning areas, is under development and will include the density-dependent capability to evaluate potential effects of saltwater intrusion due to sea level rise, according to estimated and projected water demands and water supply availability.

Future Adaptive Management Strategies

The SFWMD will monitor local, state, and national research projects, interpret the results, and initiate appropriate actions to protect the region's water resources as the effects of climate change become more evident. In addition, the SFWMD is re-evaluating the complex water management system and determining appropriate adaptation measures. New and continuing actions by the SFWMD to address climate change and sea level rise effects during the planning period of this update (2019 to 2045) include the following:

- ◆ Implement coastal structure hardening strategies, according to recent vulnerability analyses and identified priorities.
- ◆ Review literature and engage in sea level rise initiatives at the national level.
- ◆ Incorporate sea level rise projections in planning associated with infrastructure for flood protection, water supply, and Everglades restoration.
- ◆ Deliver data, analysis results, and tools to support decision-making under high uncertainty.
- ◆ Monitor and map the position of the saltwater interface every 5 years.
- ◆ Develop surface water and groundwater models that simulate the effects of sea level rise.
- ◆ Develop methods and collect data for future rainfall and temperature assumptions.
- ◆ Operate salinity control structures to prevent or minimize inland encroachment of seawater.
- ◆ Incorporate the effects of climate change and sea level rise, along with other changes in hydrology, into the review process when minimum flows and minimum water levels (MFLs) and water reservations are re-evaluated.
- ◆ Support development of alternative water supply projects and promote water conservation to increase the security and diversity of water sources, as withdrawing less water from aquifers helps to prevent saltwater intrusion.
- ◆ Study the possible use of coastal canals for additional storage to manage groundwater levels and slow saltwater intrusion.

As summarized above, climate change may affect water supply sources and should be considered when evaluating the ability of water supplies to meet future demand. In addition, climate change could alter patterns of water demand, thereby becoming an important consideration in demand projections. Changes in water supply and demand would necessitate infrastructure adaptation. Increased capture and storage of rainfall and stormwater could address limited availability of SAS sources, mitigate the impacts of increased flooding events, and offset predicted decreases or variability in effective rainfall.

Coordination with other resource management entities and governments is vital to ensuring a common approach and shared information moving forward, recognizing that effective solutions and adaptations require action across multiple agencies and administrative boundaries. The Florida Water and Climate Alliance is a collaborative stakeholder-scientist partnership focused on climate and water resource issues that will facilitate the co-development of locally relevant climate science data and tools for water resource planning and supply operations. Although climate change poses significant challenges to water supply availability, local management actions and regional collaborations can alleviate the associated impacts and enhance the reliability of water supply.

UTILITIES VULNERABLE TO DRY CONDITIONS

The inland movement of seawater primarily affects coastal communities. The entire east coast of Florida is particularly susceptible to lateral saltwater intrusion due to the following factors:

- ◆ Proximity to the Atlantic Ocean, inlets, and lagoons
- ◆ Numerous coastal wellfields
- ◆ Drainage canals that lower the water table, which reduces the water pressure exerted against the saltwater interface
- ◆ Canals without coastal water control structures to inhibit inland movement of seawater
- ◆ Rising sea levels

In 2007, the SFWMD began evaluating and identifying PS utilities with shallow water supply sources near the saltwater interface that were potentially vulnerable to saltwater intrusion or reduced availability during drought conditions (SFWMD 2009b). The primary purpose of the SFWMD's evaluation was to increase awareness of the potential for saltwater intrusion in groundwater (due to lowered water tables) and surface water (due to the migration of saltwater or limited availability). The SFWMD's evaluation considers utilities' existing water supply sources, including alternative sources, and future, planned projects and initiatives to diversify water supply sources, reduce vulnerability, and ensure a more reliable water supply during future dry periods. These evaluations are regional and subregional assessments for water supply planning purposes only, and do not constitute any regulatory determination or agency action regarding the utilities listed herein.

Considerations used in the evaluation for this 2021 UEC Plan Update included whether the utility had wellfields near the saltwater interface or relied on surface water sources, the availability of other water sources (e.g., inland wellfield, alternative water sources, interconnects with other utilities), and the ability of the alternatives to meet demands. The following utilities, listed north to south, have an SAS wellfield near the saltwater interface but also have access to other water sources during drought conditions:

- ◆ Fort Pierce Utilities Authority
- ◆ Martin County Utilities
- ◆ City of Stuart
- ◆ South Martin Regional Utility

Wellfields along the coast are particularly susceptible to saltwater intrusion during drought conditions. Utilities can respond to the threat of saltwater intrusion by:

- ◆ Shifting pumpage to inland wells to reduce demand on coastal wells
- ◆ Reducing withdrawals from the SAS by using the FAS as an alternative source
- ◆ Employing additional water conservation methods to reduce overall water demand
- ◆ Expanding water reuse programs to reduce potable water and self-supplied SAS withdrawals used for irrigation

GROUNDWATER MODELING

The SFWMD has developed two models that include all or part of the UEC Planning Area: Lower East Coast Subregional (LECs_R) Model and ECFM (**Figure D-10**). Information from the East Central Florida Transient Expanded (ECFTX) Model was used to update the 2014 version of the ECFM for this 2021 UEC Plan Update.

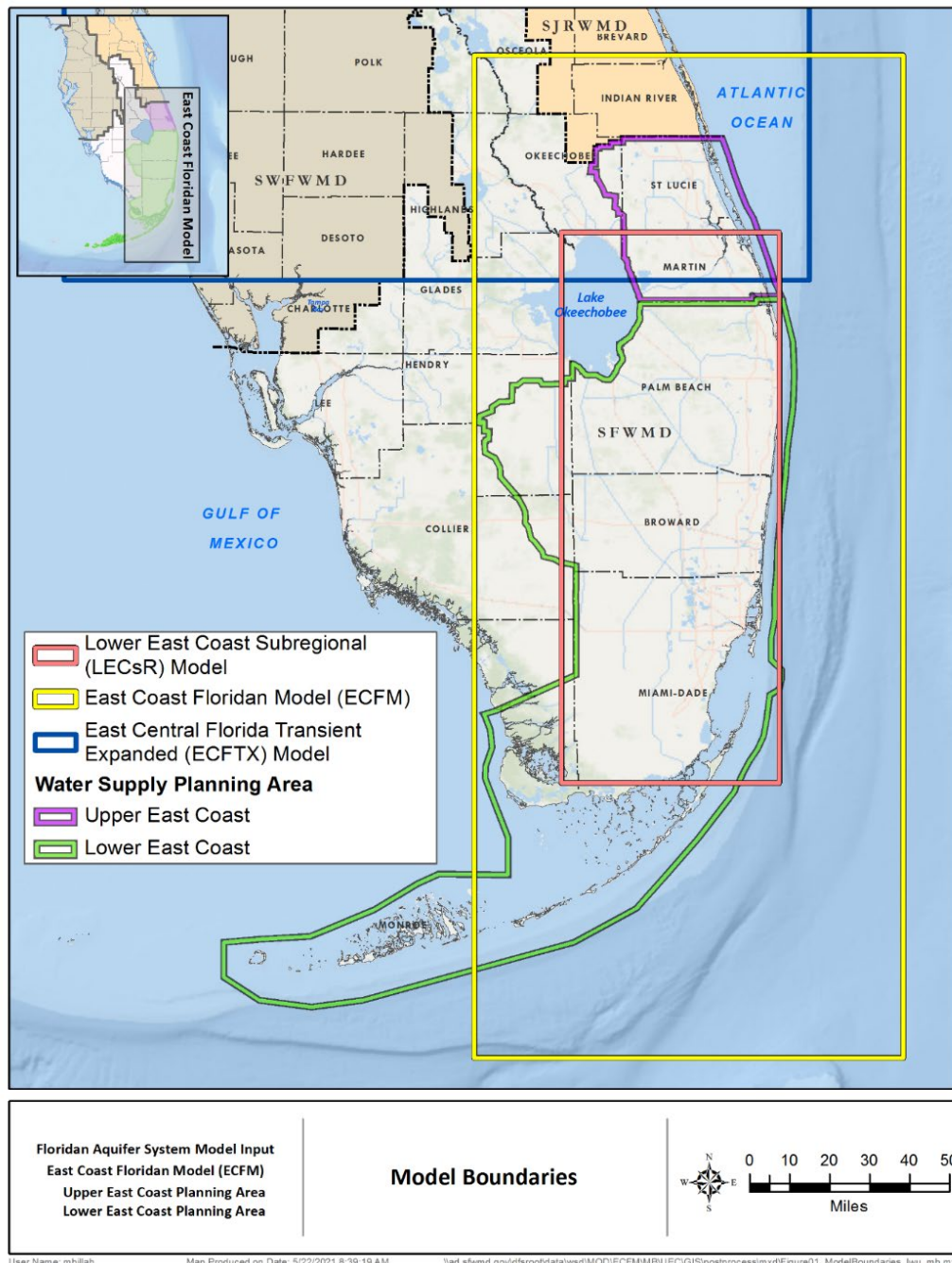


Figure D-10. Model boundaries for the Lower East Coast Subregional Model, East Coast Floridan Model, and East Central Florida Transient Expanded Model.

East Coast Floridan Model

The ECFM is a density-dependent groundwater flow and solute transport model of the FAS, encompassing the District's UEC and Lower East Coast planning areas. The model simulates regional groundwater levels, flows, and water quality changes in the FAS in response to withdrawals. The model was designed with seven layers (**Figure D-11**), from the Upper Floridan aquifer (UFA) (Layer 1) to the Boulder Zone (Layer 7), and model cells are 2,400 feet by 2,400 feet in size. The UFA and Avon Park permeable zone (APPZ) are the two layers used for water supply in the UEC Planning Area. The ECFM does not simulate surface water or the SAS. An independent peer review of the model was conducted in 2011, and the panel's comments were incorporated into the 2014 version of the model. The revised model was calibrated with data from 1989 through early 2013 (Giddings et al. 2014). In early 2021, the ECFM was updated with new hydrogeologic and hydrostratigraphic data and re-calibrated (Billah et al. 2021).

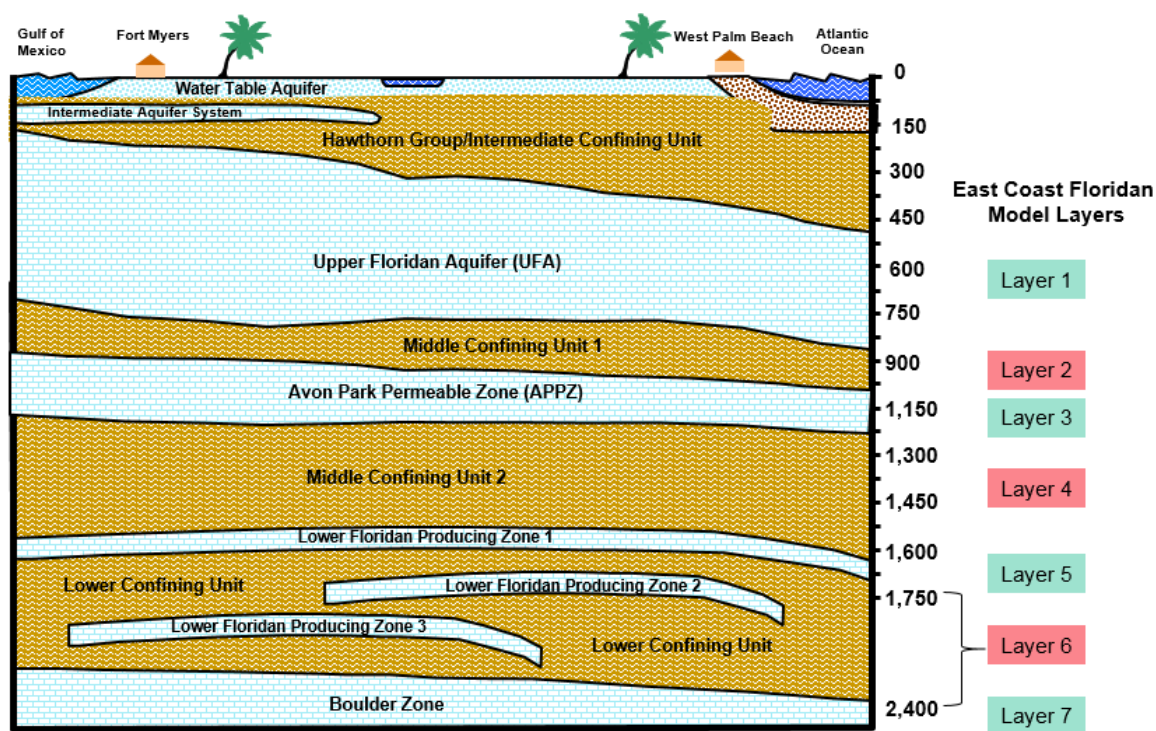


Figure D-11. East Coast Floridan Model layers.

The ECFM was developed for regional water supply planning purposes and uses the best available data on aquifer characteristics and water quality. Water use data included the locations of existing wells in addition to reported, estimated, or projected use. For future wells, location information was provided by permittees. The model primarily uses total dissolved solids (TDS) concentrations to track changes in water quality; in the FAS, chlorides generally make up approximately 50% of TDS. To support the 2021 UEC Plan Update, the ECFM simulated 2019 and 2045 FAS demands in the UEC Planning Area. Information regarding major utilities adjacent to the UEC Planning Area, including Hobart and Oslo (Indian River Utilities), City of Vero Beach, Okeechobee Clean Energy Center, Town of Jupiter, Village of Tequesta, and Seacoast Utility Authority, was updated as well to accurately identify any cumulative potential impacts to the FAS from areas beyond the planning area boundary.

Model Setup

For each permitted FAS user, pumping volumes and well/wellfield locations were input to the ECFM for the 2019 and 2045 simulations. The model simulated 2019 withdrawals from actual reported pumpage or estimated data, and 2045 withdrawals were obtained from the estimated demands identified in **Chapter 2** and **Appendix B**. General descriptions of the pumping volumes and locations used in the model are as follows:

- ◆ For Public Supply (PS) utilities, commercial and industrial uses, and landscape and recreational irrigation, estimates of FAS withdrawals were based on actual data from permittees for 2019 and projected demands based on population growth rates for 2045, with consideration given to water use permit information (e.g., available allocation, wellfield operations, proposed wellfields) and discussions with utility staff.
- ◆ Agricultural irrigation demands were derived from the Agricultural Field-Scale Irrigation System (AFSIRS) model using 2018 land use data for the 2019 base condition. For 2045, irrigation demands were estimated using AFSIRS based on 2045 Florida Statewide Agricultural Irrigation Demand (FSAID) land use data.
- ◆ For the Treasure Coast Energy Center and Okeechobee Clean Energy Center power generation facilities, actual demands for 2019 and projected demands for 2045 were used.
- ◆ Existing well locations were determined using information in water use permits. For proposed PS wells not yet permitted, information was provided by utilities.
- ◆ Actual well withdrawals were used for the 2019 simulation, except for agricultural irrigation withdrawals, which were calculated from AFSIRS. For the 2045 simulation, total demand for each user typically was distributed evenly among the user's existing and proposed wells. Historical use patterns were considered, along with wells removed from service or minimally used, when distributing demands.
- ◆ If distributing 2045 demands to all of a user's permitted wells resulted in less than 0.50 million gallons per day (mgd) per well, not all wells were used. Increased demands were distributed among existing wells if additional wells were not listed in the water use permit or provided by the utility.

Many PS utilities have implemented specific wellfield operation strategies to manage water quality changes, including rotating wells, reducing withdrawals, and resting wells for longer periods of time. Because of the regional nature of the ECFM, the model's monthly time increments, and utility-specific operations, these strategies were not simulated in the model.

Model Scenarios

Two 24-year modeling scenarios were conducted using the ECFM. The first scenario analyzed the potential impacts of 24 years of pumping the 2019 FAS volumes. The second scenario evaluated the potential impacts of pumping the 2045 FAS volumes for 24 years. Both scenarios started with the same water level (potentiometric surface elevations) and TDS data values. The starting data were extracted from the final month of the calibration period (December 2012). The ending water levels, TDS concentrations, and flow properties of the two scenarios were compared to each other to identify changes in water levels, water quality, and flows. A summary of the FAS groundwater withdrawals used in the two scenarios is provided in **Table D-1**.

Table D-1. Average Floridan aquifer system withdrawals (in mgd) simulated in the UEC Planning Area in the East Coast Floridan Model scenarios.

Water Use Category*	2019	2045
Public Supply	36.18	59.74
Agriculture	37.87	31.45
Commercial/Industrial/Institutional	0.18	0.18
Landscape/Recreational	2.74	4.20
Power Generation	1.45	3.34
Total	78.42	98.91

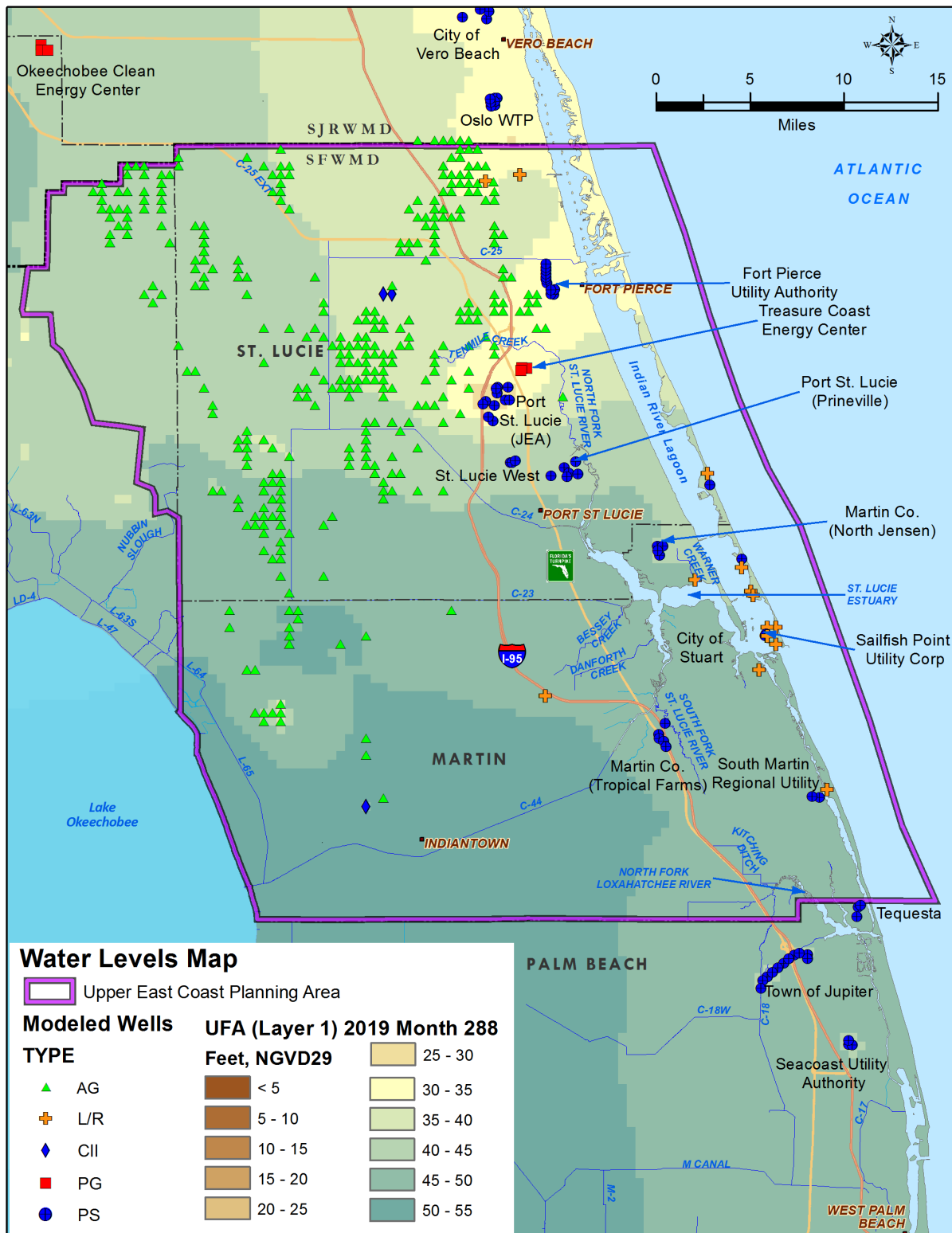
mgd = million gallons per day.

* Floridan aquifer system not used for Domestic Self-Supply.

Model Results

Final simulated water levels for the 2019 and 2045 scenarios (month 288) and water level changes between 2019 and 2045 are shown in **Figures D-12 to D-14** for the UFA and in **Figures D-15 to D-17** for the APPZ. Month 288 represents the final month of the 24-year simulation period. **Table D-2** describes the range of values from the model results and identifies users in the areas where the lowest water levels or highest TDS concentrations occur.

Model results of simulated water quality are shown in **Figures D-18 to D-23** for the UFA and APPZ. Water quality at the end of the 2019 and 2045 scenario (month 288) is shown for the UFA in **Figures D-18 and D-19**, and the change in water quality in the UFA between the 2019 and 2045 scenarios is shown in **Figure D-20**. Water quality in the APPZ at the end of the 2019 and 2045 scenario (month 288) is shown in **Figures D-21 and D-22**, and the change in water quality in the APPZ between the 2019 and 2045 scenarios is shown in **Figure D-23**.



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Figure D-12. Water levels in the Upper Floridan aquifer (Layer 1) at the end of the 2019 scenario.

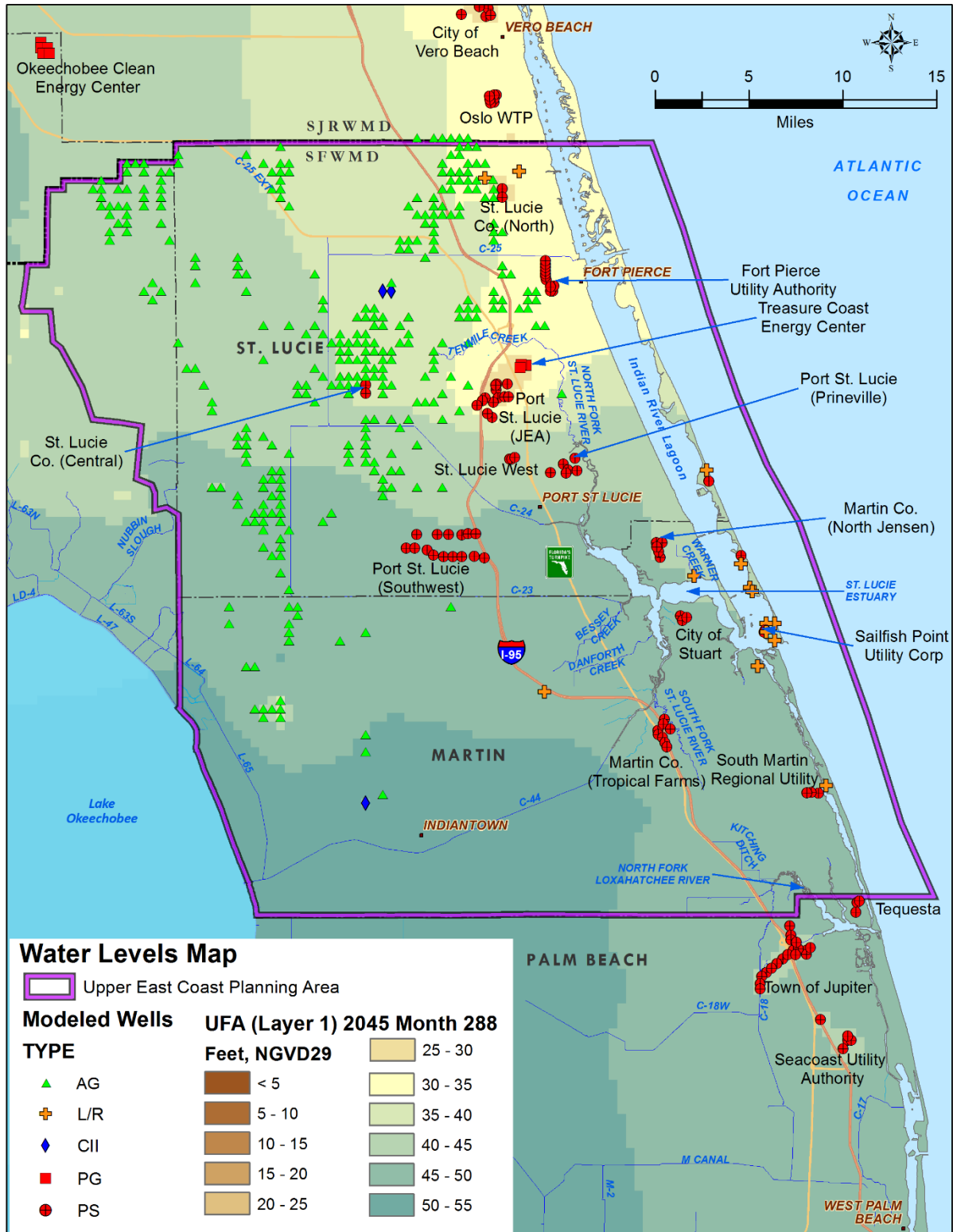


Figure D-13. Water levels in the Upper Floridan aquifer (Layer 1) at the end of the 2045 scenario.

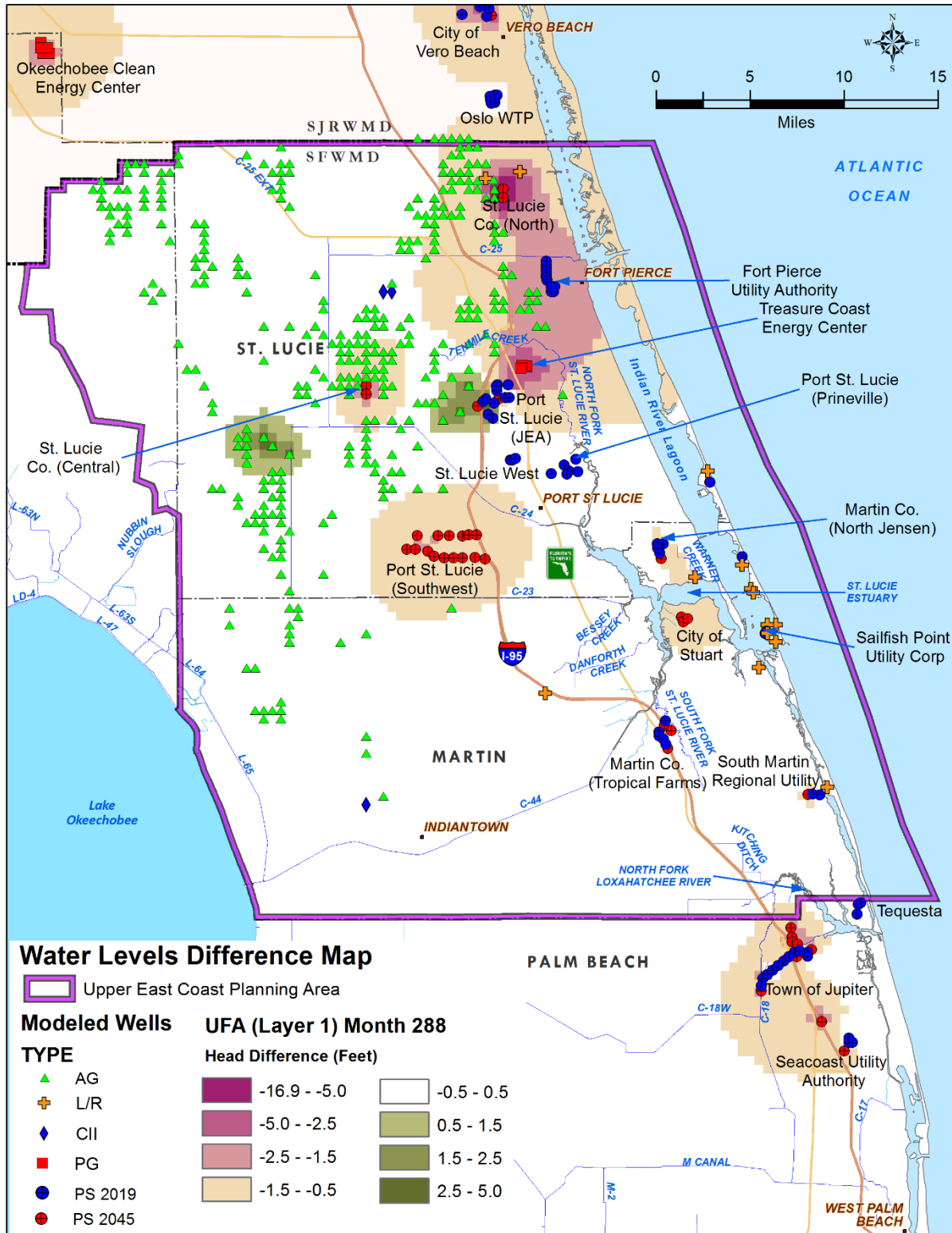
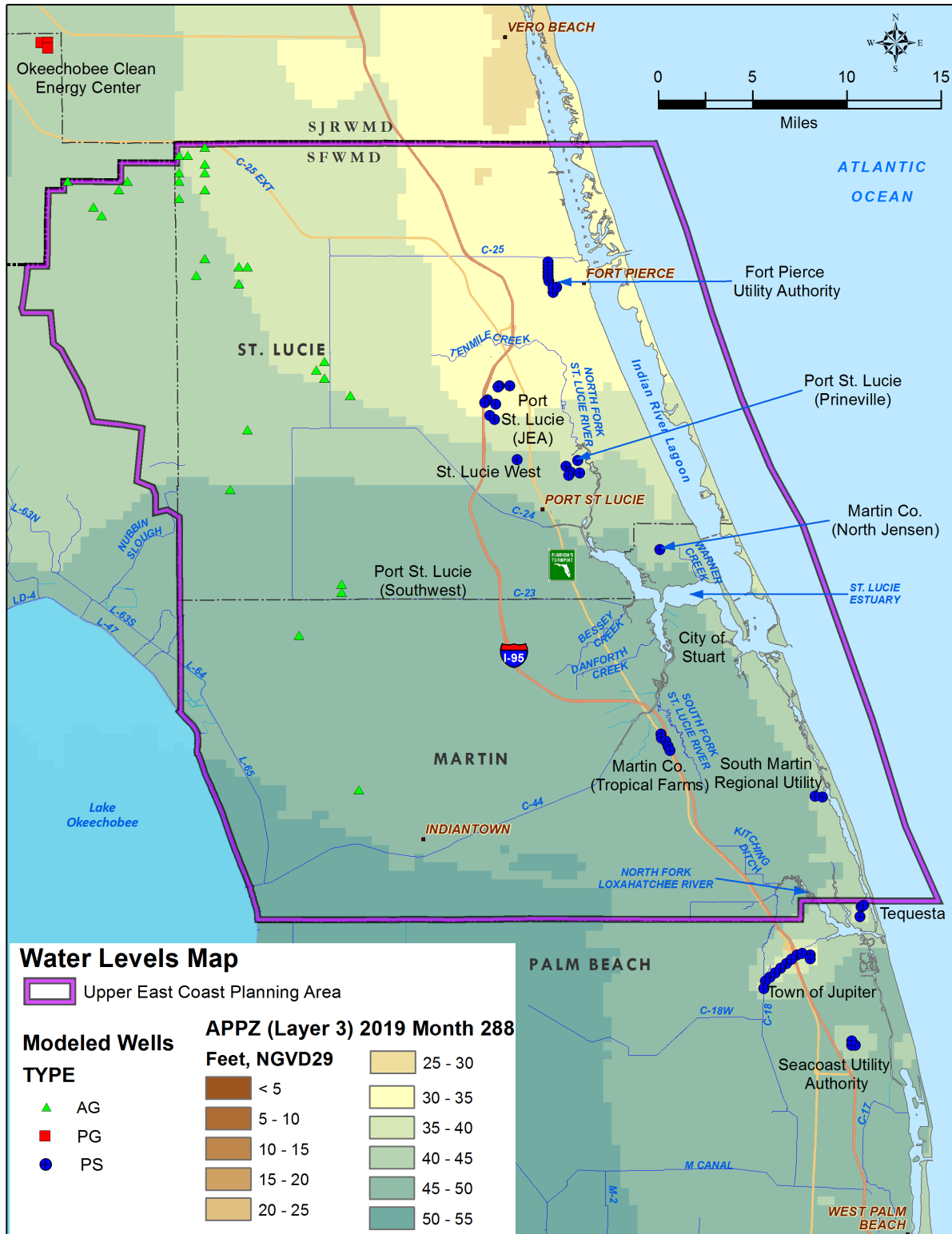
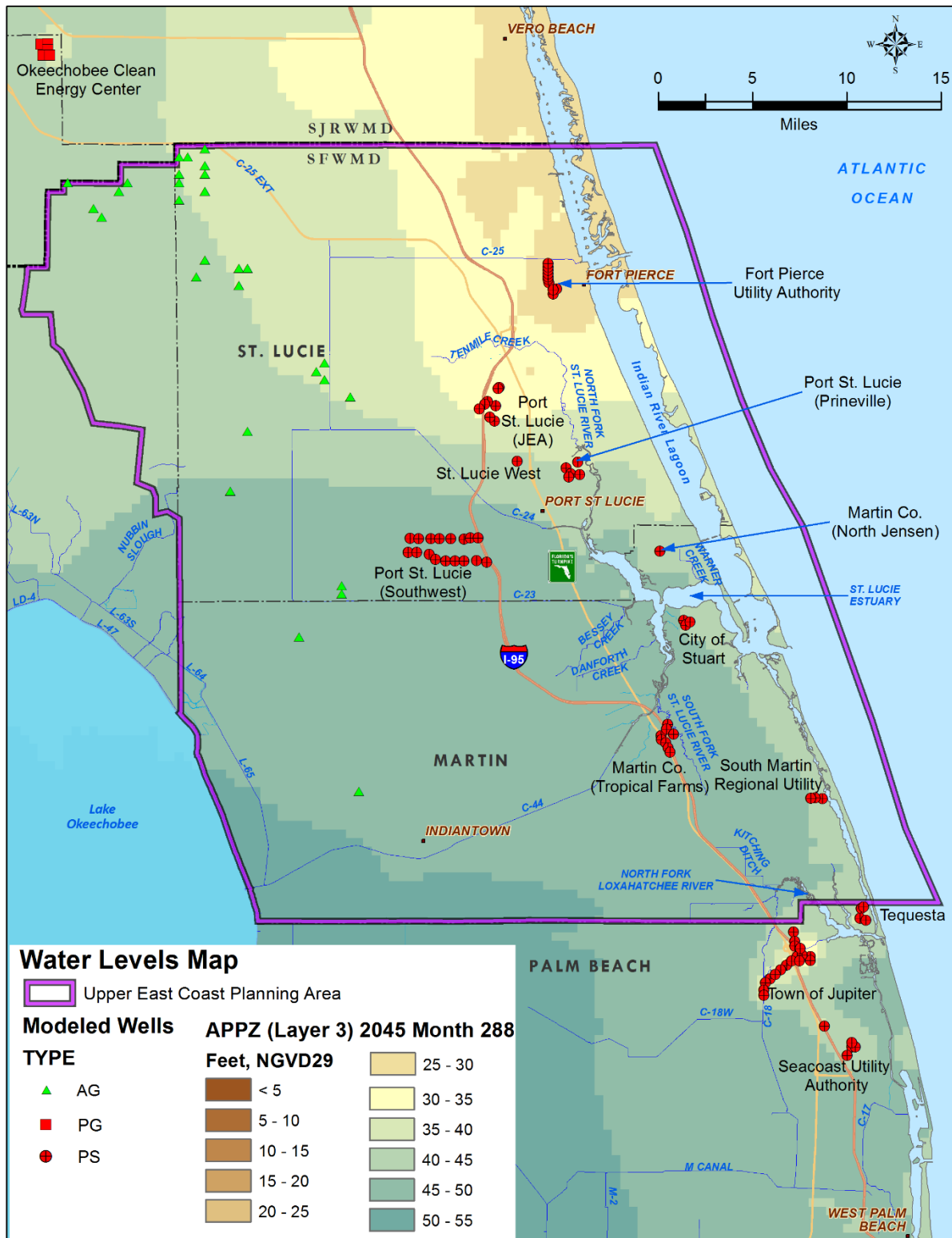


Figure D-14. Water level changes (head difference) in the Upper Floridan aquifer (Layer 1) between the 2019 and 2045 scenarios at the end of the simulation period (month 288).



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Figure D-15. Water levels in the Avon Park permeable zone (Layer 3) at the end of the 2019 scenario.



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Figure D-16. Water levels in the Avon Park permeable zone (Layer 3) at the end of the 2045 scenario.

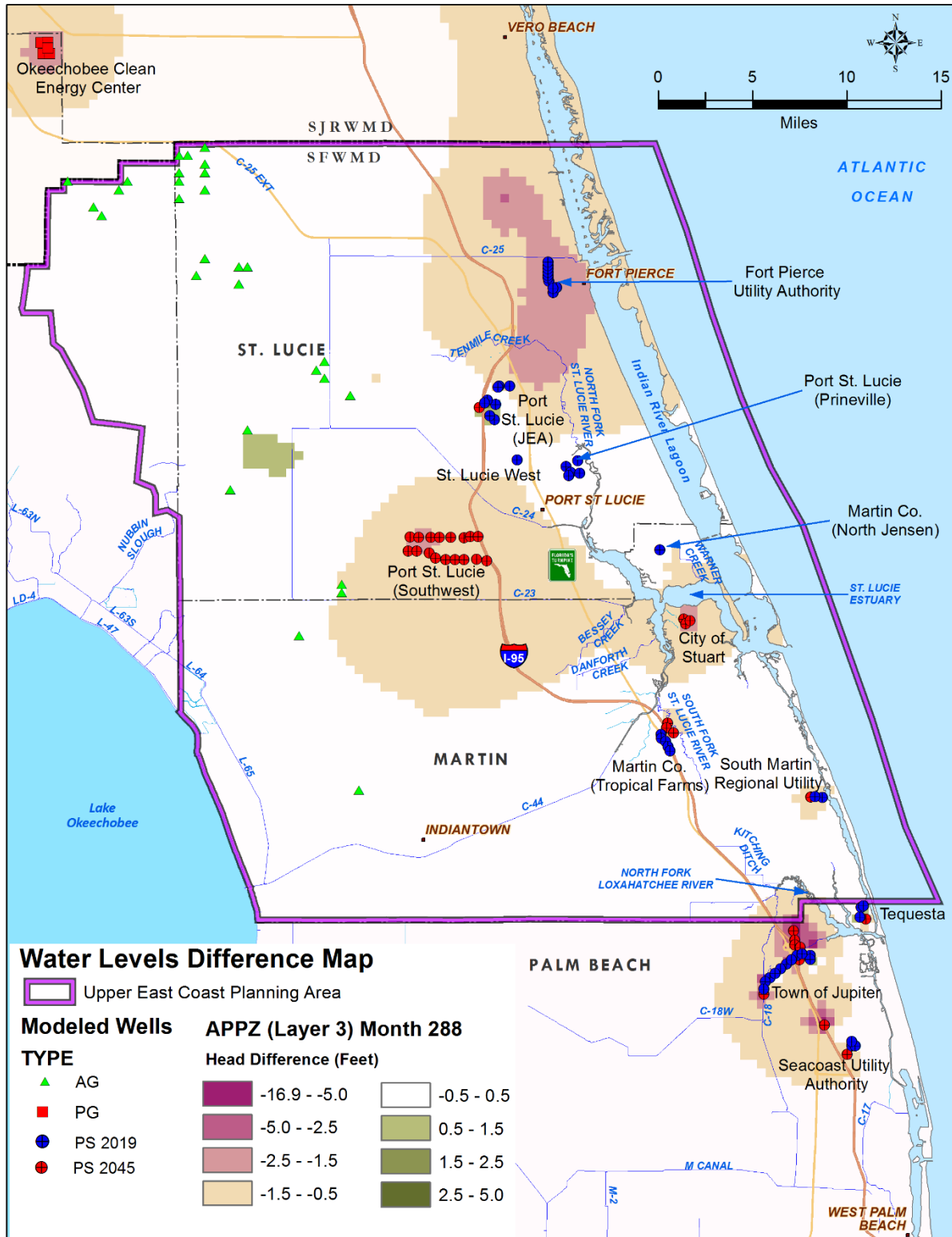


Figure D-17. Water level changes (head difference) in the Avon Park permeable zone (Layer 3) between the 2019 and 2045 scenarios at the end of the simulation period (month 288).

Table D-2. Summary of East Coast Floridan Model results for water levels and water quality (i.e., total dissolved solids concentrations).

Parameter	Upper Floridan Aquifer			Avon Park Permeable Zone		
	Range of Values ^a	Value for Identifying Affected Users	Affected Users	Range of Values ^a	Value for Identifying Affected Users	Affected Users
2019 Scenario						
Water Level (feet NGVD29)	23 to 53	<36	St. Lucie County Utilities (North) ^b	30 to 52	<35	St. Lucie County Utilities (North) ^b
			Fort Pierce Utilities Authority			Fort Pierce Utilities Authority
			Treasure Coast Energy Center			Treasure Coast Energy Center
			Port St. Lucie Utility Systems Dept. (JEA Wellfield)			Port St. Lucie Utility Systems Dept. (JEA Wellfield)
Total Dissolved Solids (mg/L)	300 to 6,700	>5,000	St. Lucie County Utilities (North) ^b	2,400 to 12,000	>8,000	St. Lucie County Utilities (North) ^b
						Fort Pierce Utilities Authority
2045 Scenario						
Water Level (feet NGVD29)	19 to 53	<25	St. Lucie County Utilities (North) ^b	28 to 52	<35	St. Lucie County Utilities (North) ^b
			Treasure Coast Energy Center			Fort Pierce Utilities Authority
Total Dissolved Solids (mg/L)	300 to 6,700	>5,000	St. Lucie County Utilities (North) ^b	2,500 to 12,000	>8,000	St. Lucie County Utilities (North) ^b
						Fort Pierce Utilities Authority
2019 to 2045 Change						
Water Level Decline (feet)	-5 ^c to 17	>15	St. Lucie County Utilities (North) ^b	-1.6 ^c to 2.8	>2	St. Lucie County Utilities (North) ^b
						Fort Pierce Utilities Authority
						City of Stuart
Total Dissolved Solids Increase (mg/L)	-100 ^c to 4,800	> 4,000	St. Lucie County Utilities (North) ^b	-150 ^c to 1,500	>1,000	St. Lucie County Utilities (North) ^b
						City of Stuart

mg/L = milligrams per liter; NGVD29 = National Geodetic Vertical Datum of 1929.

^a Lowest and highest values from model domain. Negative values indicate an increase in water level.

^b Utilities not pumping from the Avon Park permeable zone.

^c Water level and water quality improvements where withdrawals ceased. Negative value indicates the rebound of water level and improvement of water quality (Total Dissolved Solids).

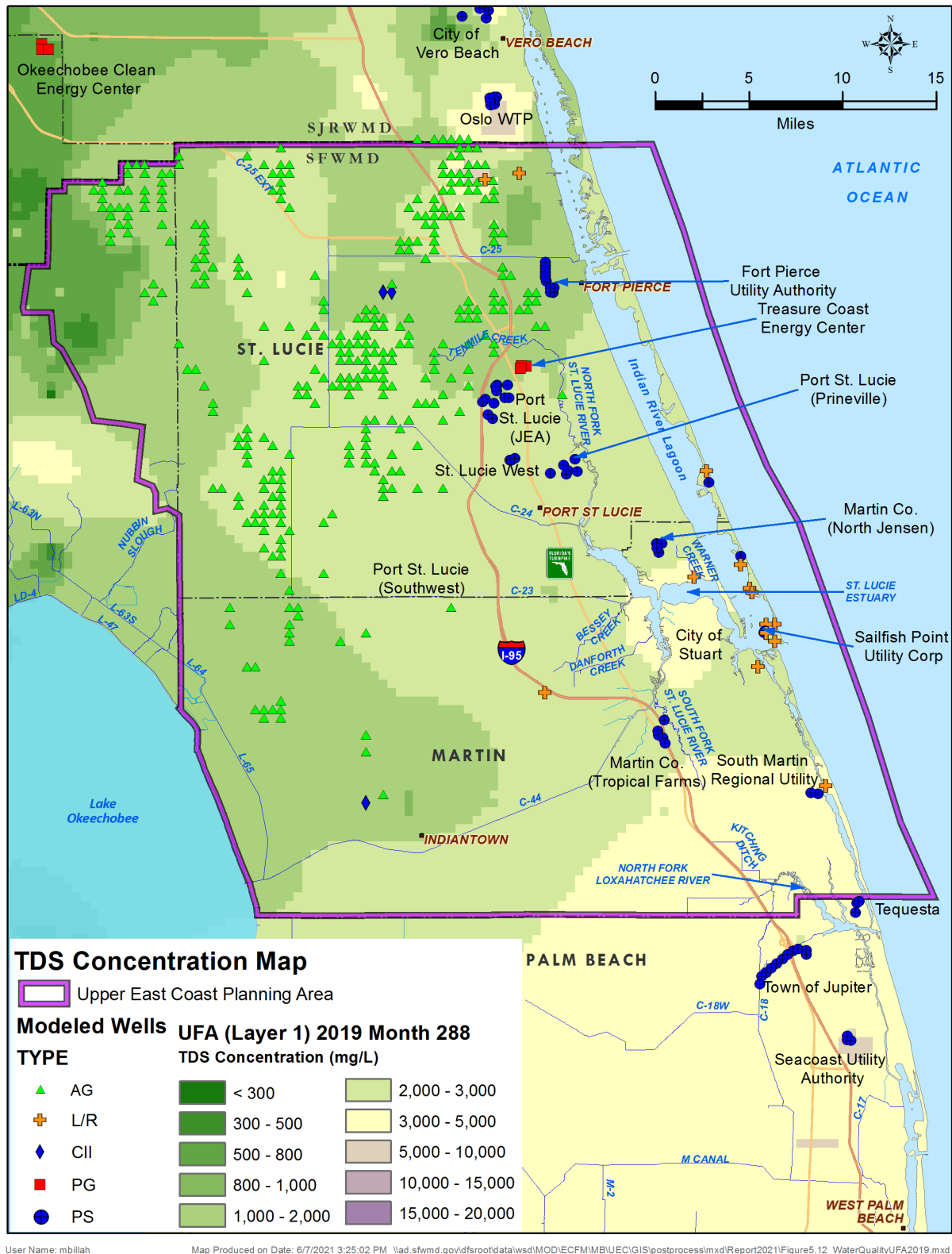


Figure D-18. Water quality (total dissolved solids) in the Upper Floridan aquifer (Layer 1) at the end of the simulation period (month 288) using 2019 demand estimates.

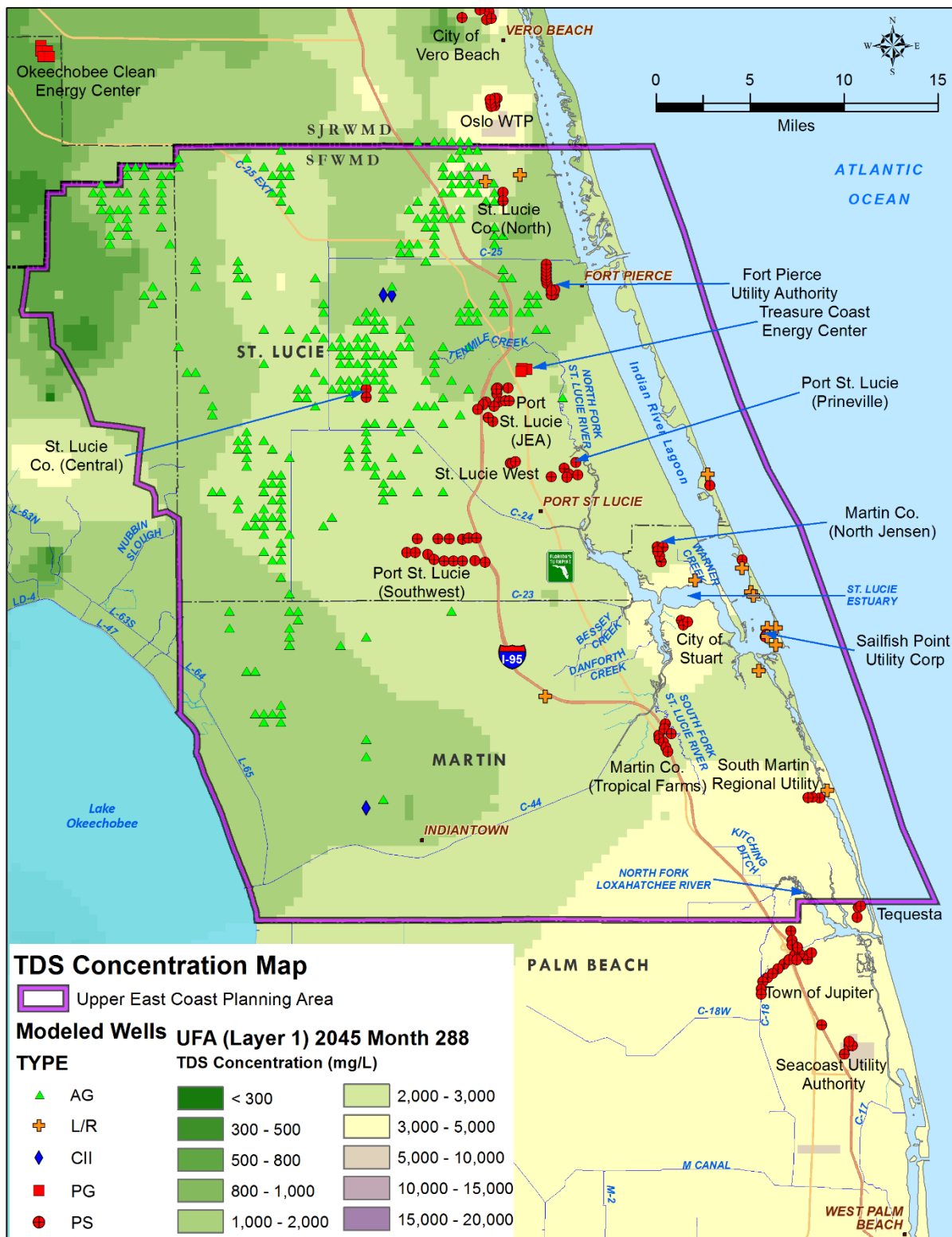


Figure D-19. Water quality (total dissolved solids) in the Upper Floridan aquifer (Layer 1) at the end of the simulation period (month 288) using 2045 demand projections.

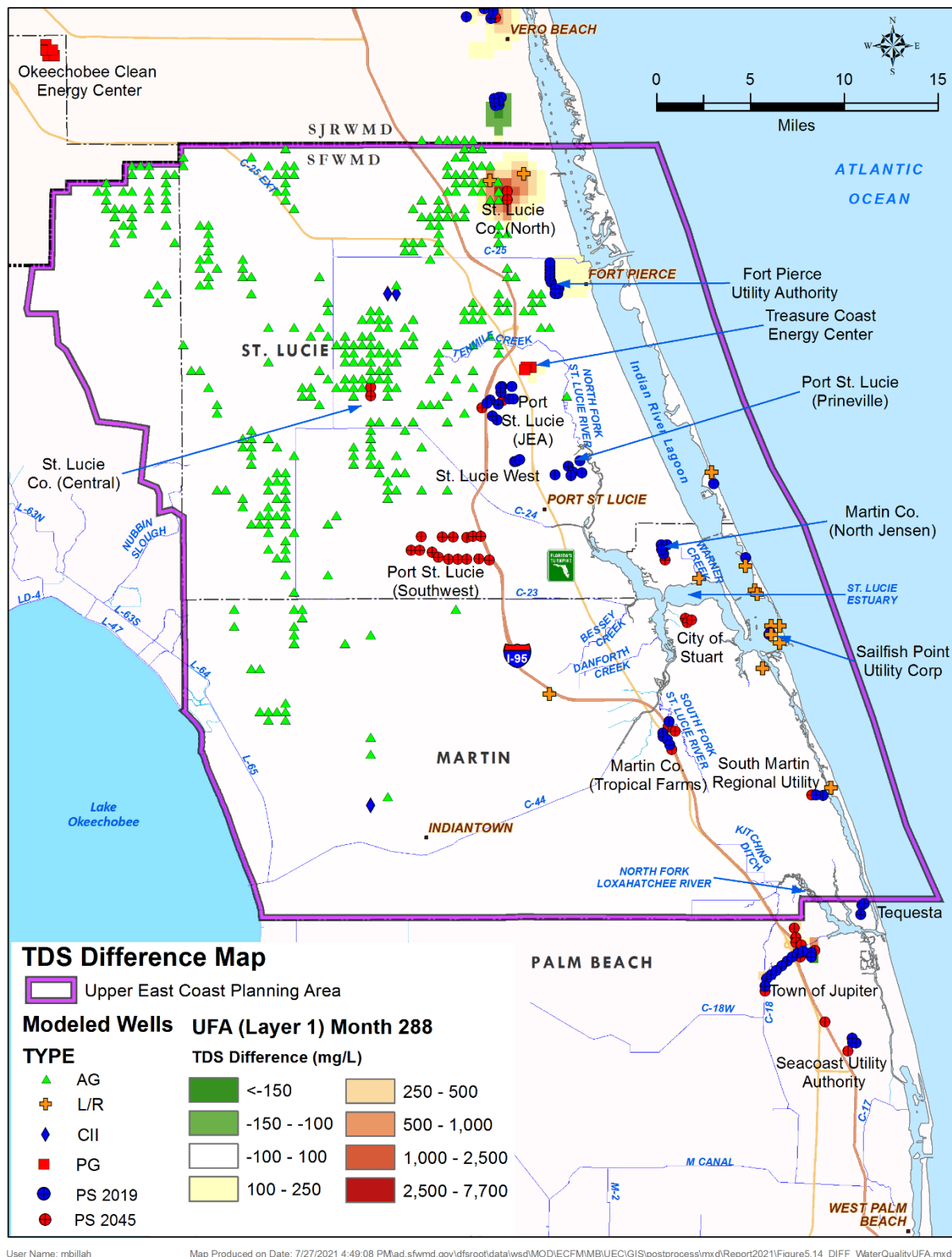


Figure D-20. Water quality (total dissolved solids) changes in the Upper Floridan aquifer (Layer 1) between the 2019 and 2045 scenarios at the end of the simulation period (month 288).

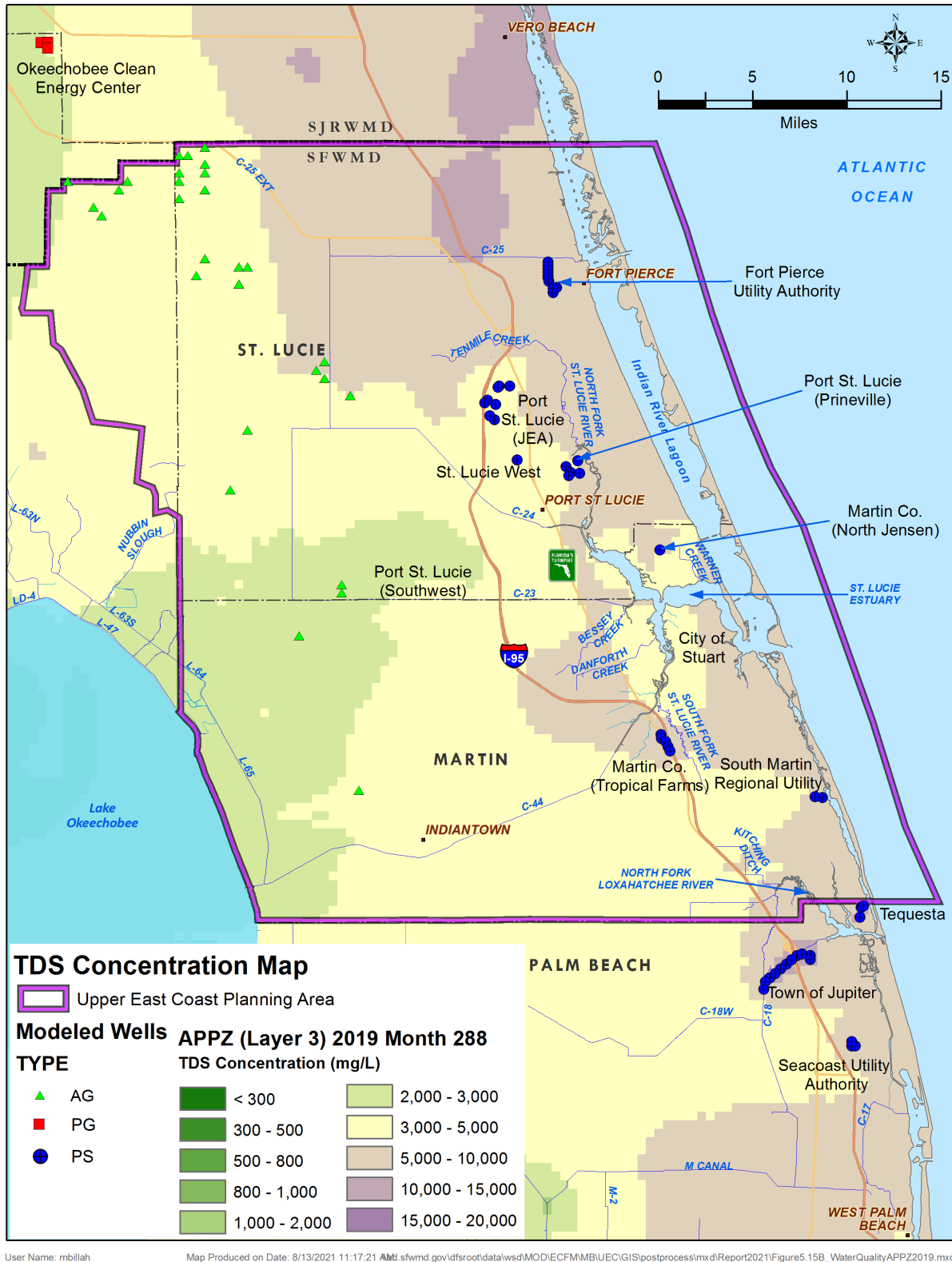
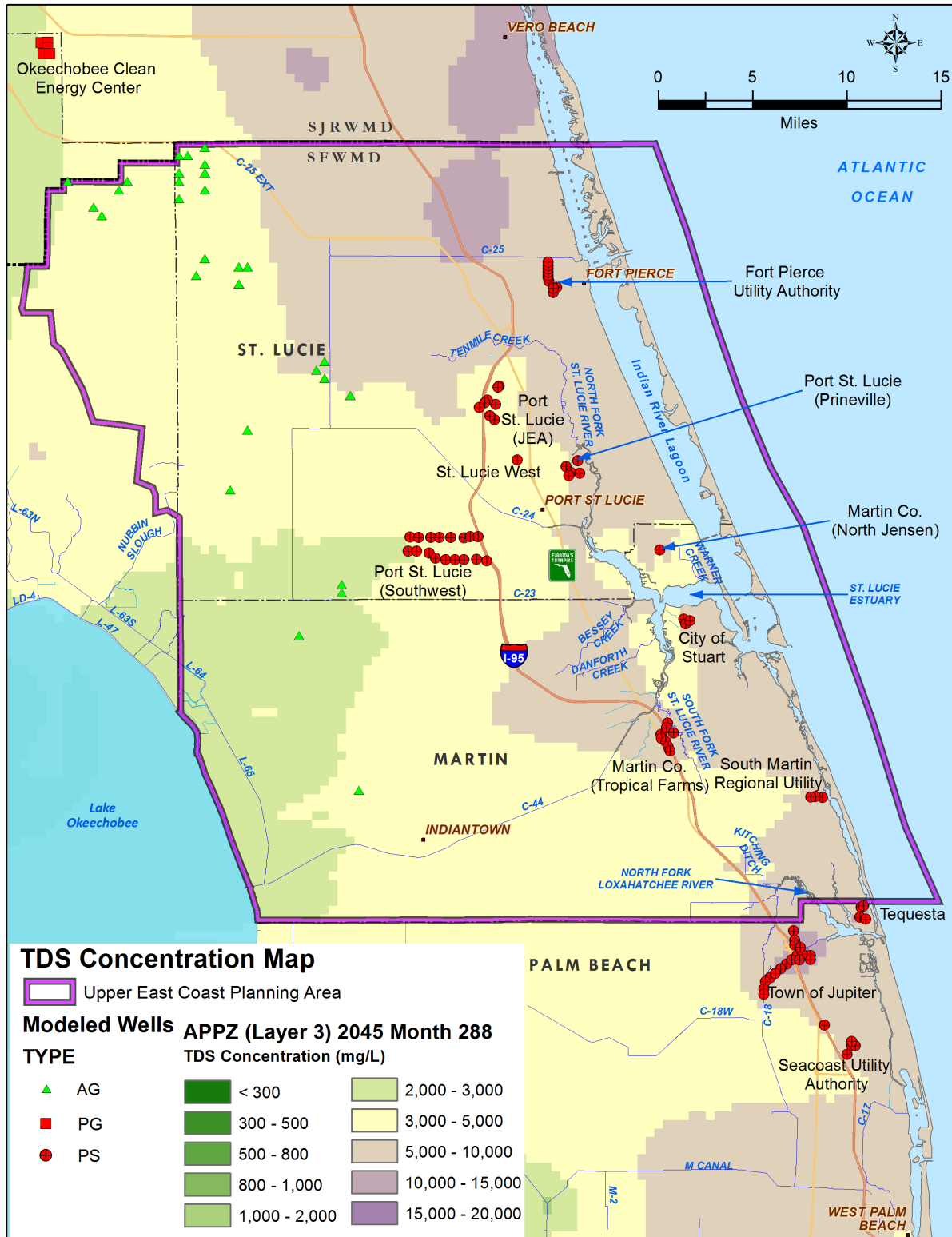


Figure D-21. Water quality (total dissolved solids) in the Avon Park permeable zone (Layer 3) at the end of the simulation period (month 288) using 2019 demand estimates.



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Figure D-22. Water quality (total dissolved solids) in the Avon Park permeable zone (Layer 3) at the end of the simulation period (month 288) using 2045 demand projections.

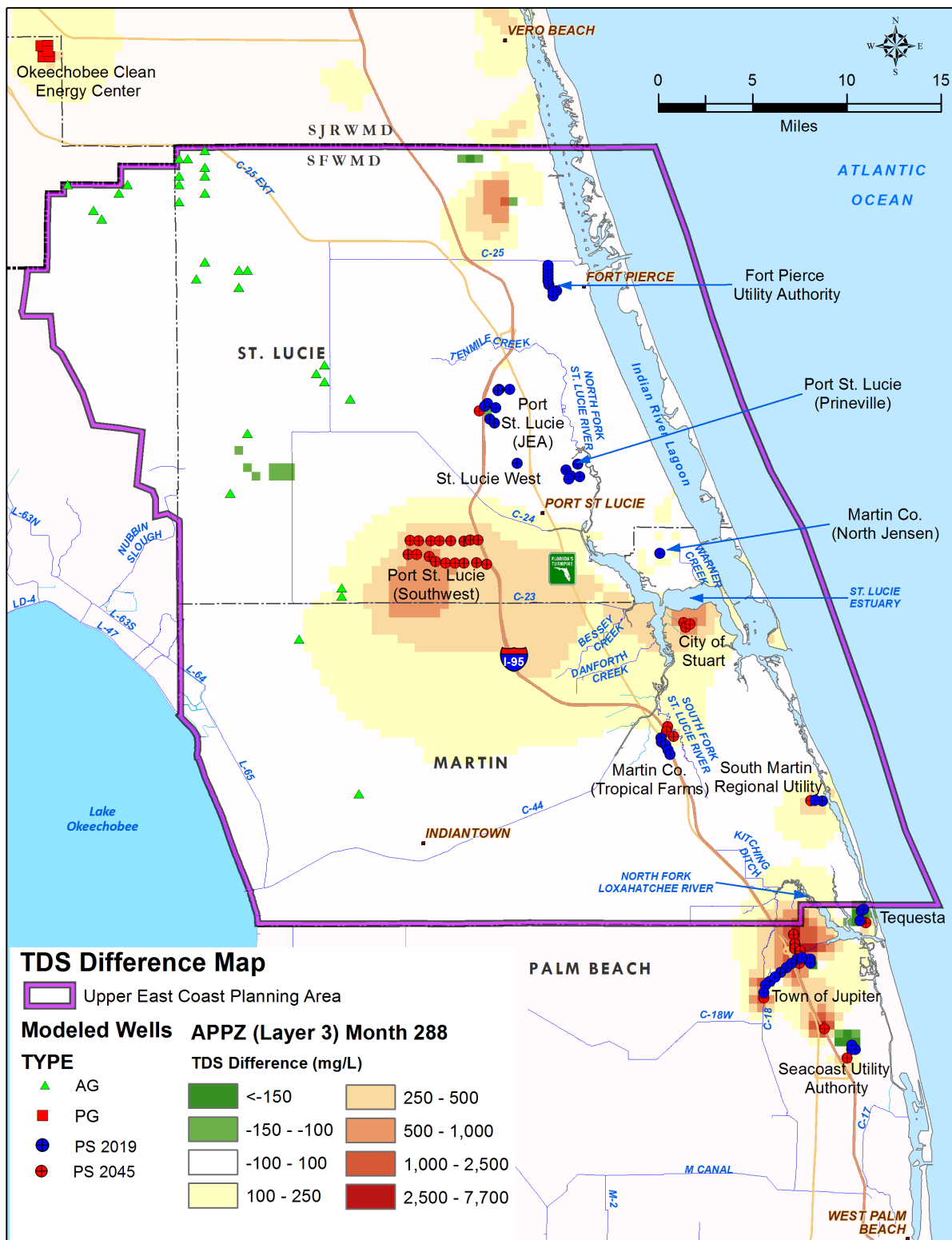
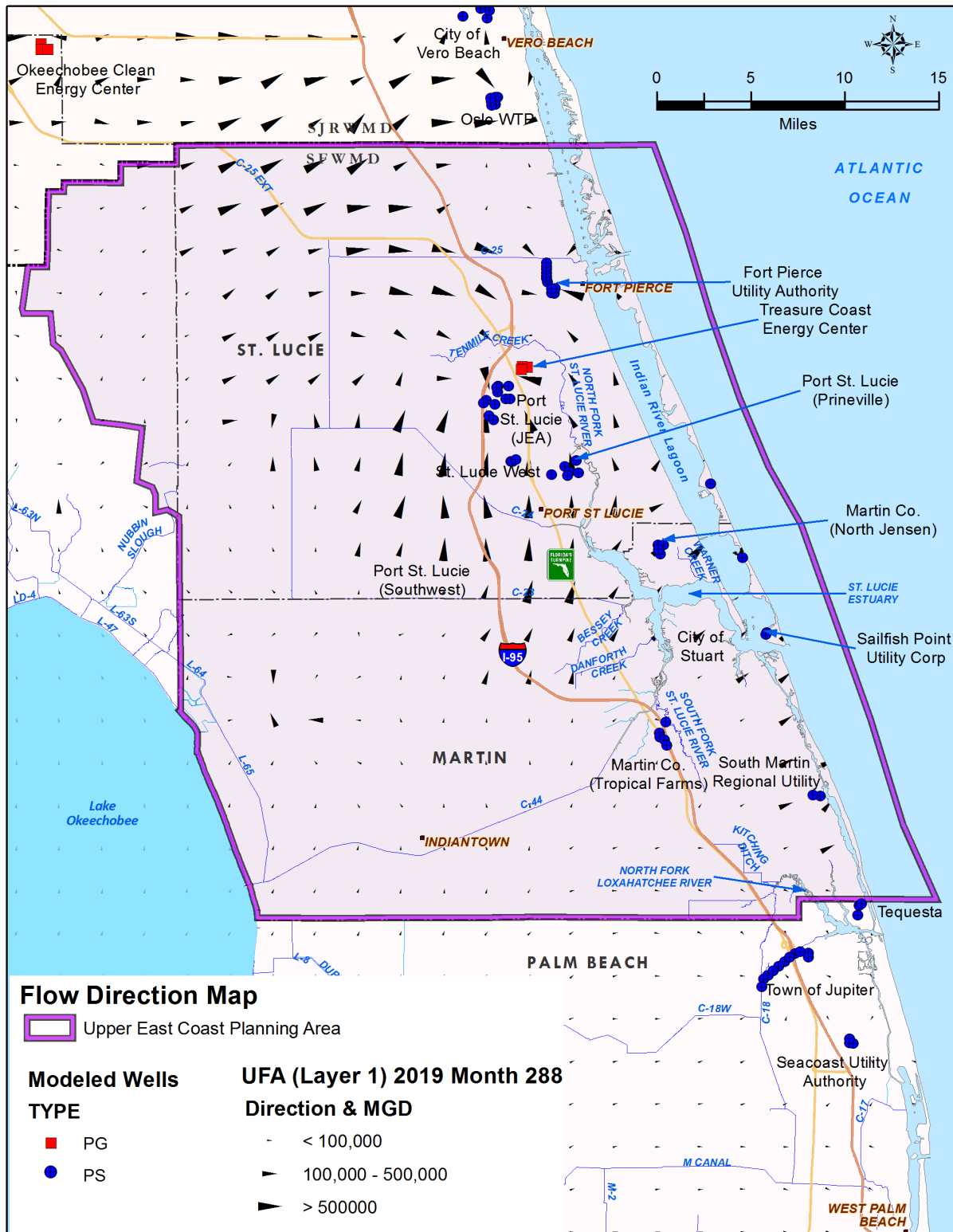


Figure D-23. Water quality (total dissolved solids) changes in the Avon Park permeable zone (Layer 3) between the 2019 and 2045 scenarios at the end of the simulation period (month 288).

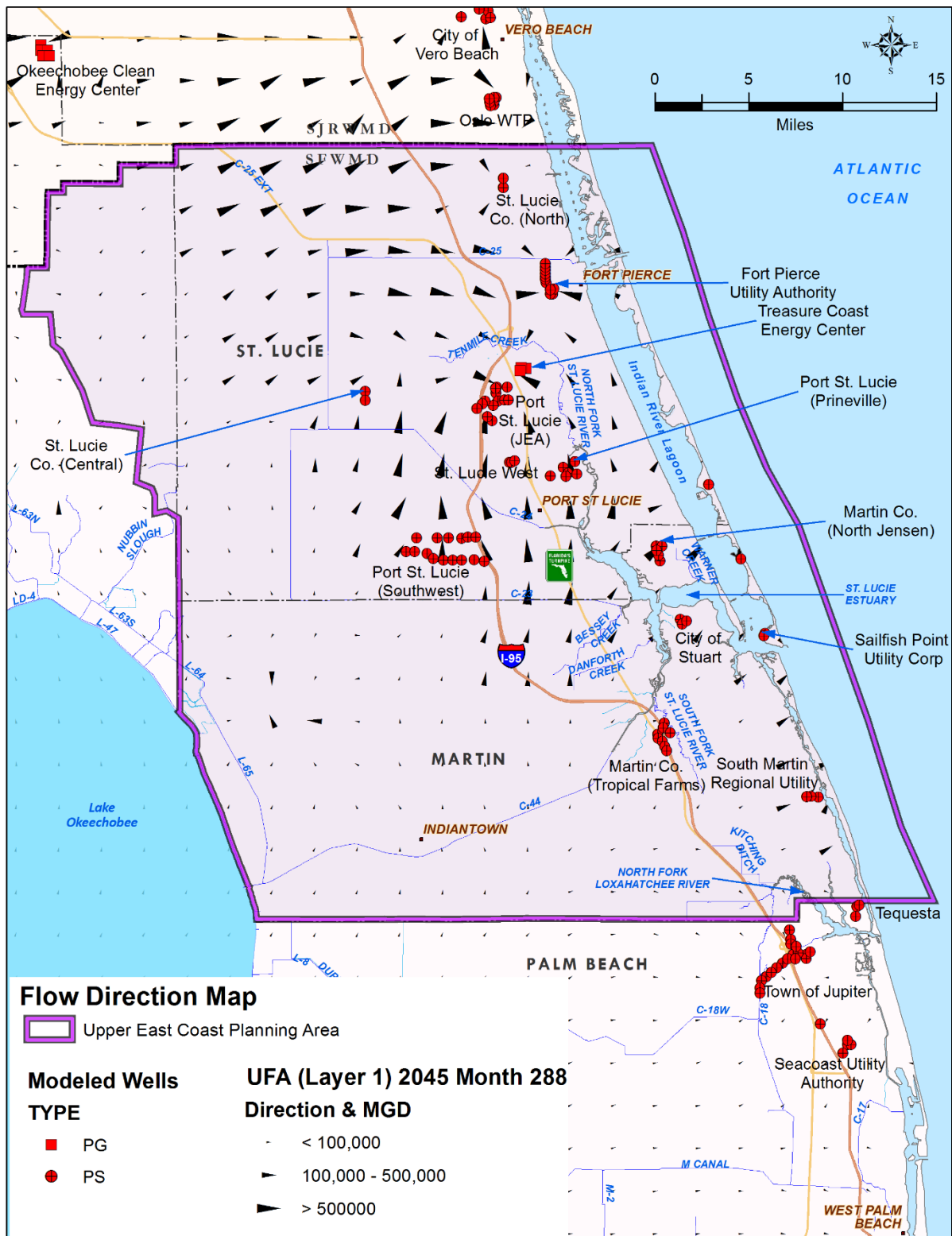
Horizontal flow vectors indicate the magnitude and direction of groundwater flow within the model layer and can be used to determine the influence of well withdrawals on groundwater flow. **Figures D-24 and D-25** are horizontal flow vector maps for the UFA when pumping the existing 2019 and projected 2045 demands. Additional horizontal flow maps and an evaluation of changes in horizontal flow direction and magnitude within a single aquifer layer are discussed in the ECFM documentation (Billah et al. 2021). Other modeling graphics and results, including individual simulated and observed well hydrographs and other regional results, can also be found in the ECFM documentation.

Figures D-26 and D-27 show the artesian head above land surface in the UFA during a dry month (month 218) for the 2019 and 2045 scenarios. The predicted change in artesian head from 2019 to 2045 is shown in **Figure D-28**. Artesian head above land surface generally increases from northwest to south/southeast in the UEC Planning Area. Reductions in artesian head as a result of future withdrawals are monitored to determine if water will continue to flow freely at land surface without pumping. This monitoring supports the restricted allocation area criteria for flowing FAS wells in Martin and St. Lucie counties (SFWMD 2021).



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Figure D-24. Horizontal flow magnitude and direction in the Upper Floridan aquifer (Layer 1) at the end of the simulation period (month 288) using 2019 demand estimates.



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Figure D-25. Horizontal flow magnitude and direction in the Upper Floridan aquifer (Layer 1) at the end of the simulation period (month 288) using 2045 demand projections.

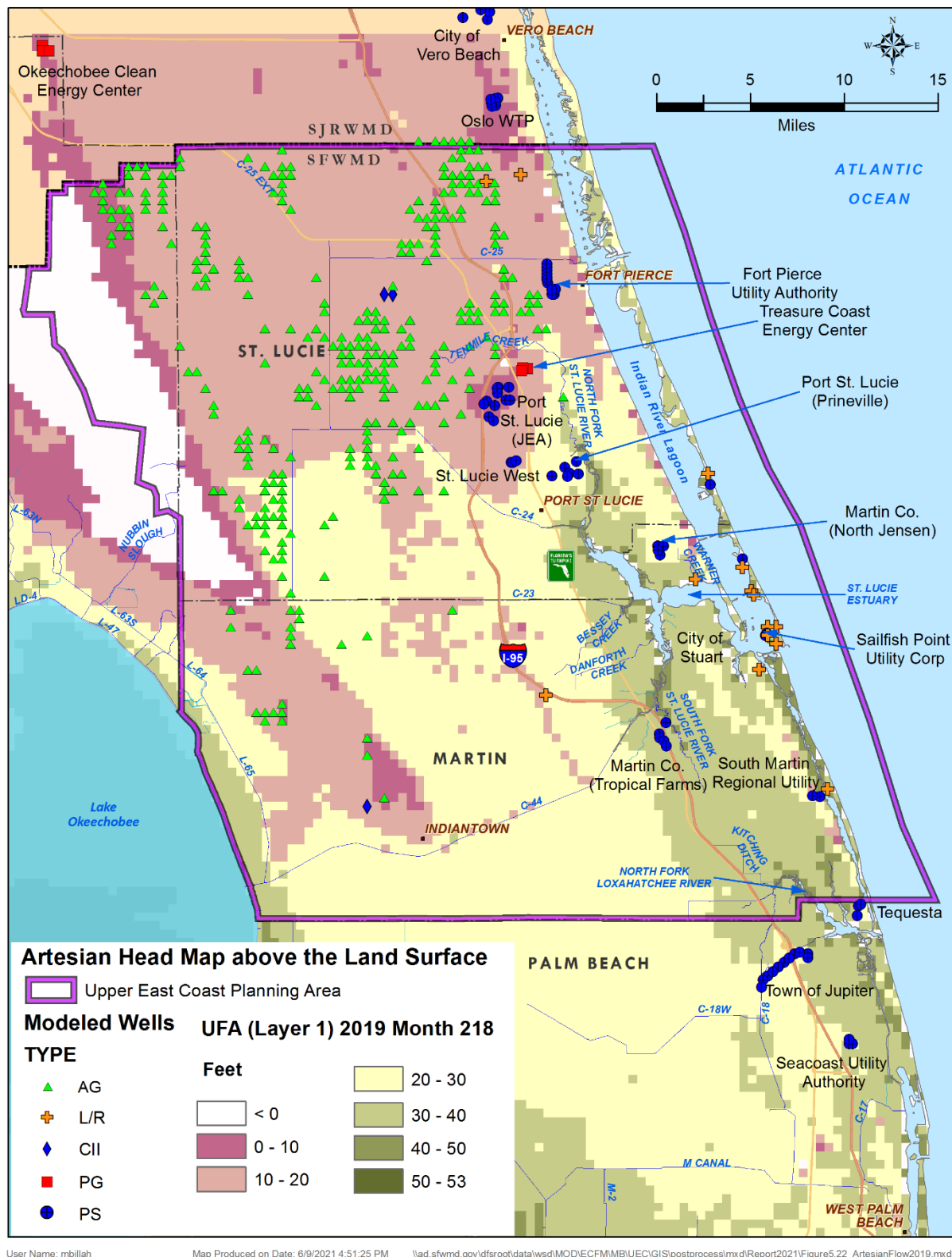
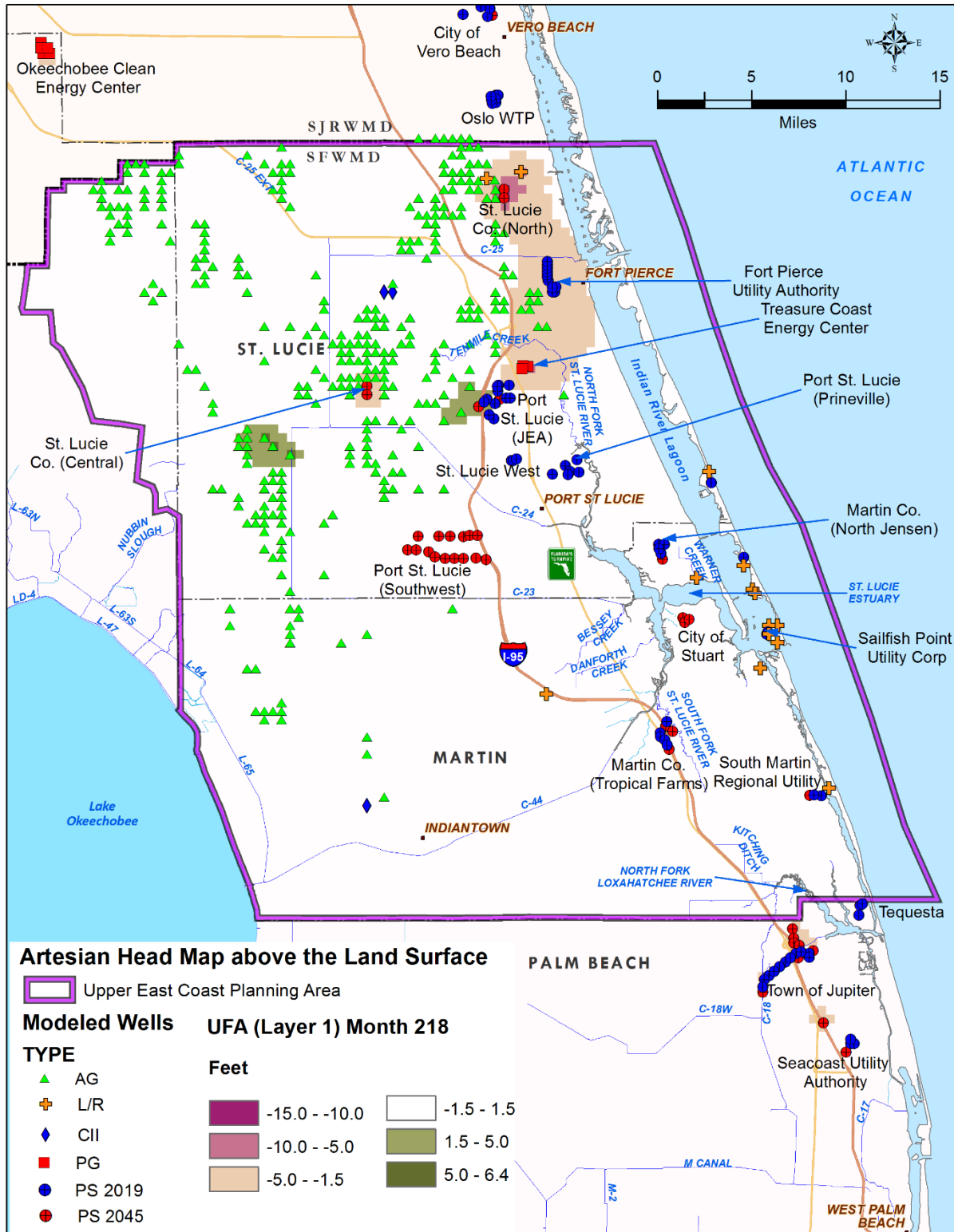


Figure D-26. Artesian heads above land surface in the Upper Floridan aquifer during a dry month (month 218) of the 2019 scenario.



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Figure D-28. Difference in artesian heads above land surface in the Upper Floridan aquifer between the 2019 and 2045 scenarios during a dry month (month 218).

Analysis of Results

The ECFM results presented herein must be considered in the proper context. First, these are planning-level evaluations. Second, the model is regional in nature, extending from central Florida to the Florida Keys, with a model cell size of 2,400 feet by 2,400 feet. Third, the model simulates continuous pumping for 24 years of 2019 and 2045 demands, but withdrawals realistically would increase gradually over time; therefore, the simulations herein are conservative in nature. Fourth, the regional nature of the model limits the ability to account for specific wellfield operations used by utilities to mitigate water quality degradation observed at individual wells. For these reasons, the model results should be used as indicators for where potential problems could be experienced if no wellfield design or operations plan is implemented to minimize movement of poor-quality water. Despite these limitations, the ECFM results indicate 2045 FAS demands in the UEC Planning Area can be met.

Analysis of the ECFM results indicated the following:

- ◆ Changes in APPZ water levels are due to direct withdrawals (approximately one-quarter of all FAS withdrawals simulated) and withdrawals from the overlying UFA. Where APPZ water levels decline near UFA withdrawals, upward movement of poor-quality water from below is predicted. The degree of confinement between the UFA and APPZ is relatively low, as shown in the simulated drawdowns and water quality changes.
- ◆ The largest projected difference in UFA water level (approximately 17 feet of drawdown) between the 2019 and 2045 scenarios was observed at the proposed North wellfield of St. Lucie County Utilities (**Figure D-14**). The 2045 demand at this location is projected to be 4.00 mgd, entirely from the UFA; however, the precise locations of the proposed wells and their spatial distribution is unknown.
- ◆ In the UFA, the most notable increase in TDS concentration [4,800 milligrams per liter (mg/L)] between 2019 and 2045 was at the proposed North wellfield of St. Lucie County Utilities. This projected increase is mainly due to anticipated upconing of poor-quality water from the underlying APPZ.
- ◆ Fort Pierce Utilities Authority's wellfield showed a maximum TDS concentration increase of approximately 200 mg/L. The flow vectors indicated some potential lateral intrusion from the coast in both the 2019 and 2045 scenarios towards the wellfield (**Figures D-24 and D-25**).
- ◆ Potential water quality degradation in the UFA near St. Lucie County Utilities' proposed North wellfield could impact the ability of nearby agricultural users to directly use the UFA for irrigation purposes.
- ◆ There is minimal change in water quality and water levels in the UFA throughout most of the model domain through 2045. Some water quality degradation occurs, but much of the change is less than 100 mg/L over 24 years. Water quality changes in the UFA between the 2019 and 2045 demands are shown in **Figure D-20**.
- ◆ In the APPZ, some water quality degradation is predicted around St. Lucie County Utilities' proposed North wellfield and the City of Port St. Lucie Utility Systems Department's Southwest wellfield. Water quality changes in the APPZ between the 2019 and 2045 scenarios are shown in **Figure D-23**.

- ◆ In the APPZ, water levels generally declined less than 3 feet in the 2045 scenario (**Figure D-16**).
- ◆ The areas with the largest water quality changes in the UFA and APPZ (**Figures D-14 and D-17**) are the areas with the largest withdrawals and water level declines, which result in upconing of poor-quality water from underlying aquifer layers.
- ◆ Artesian heads that flow naturally above land surface showed a noticeable reduction between St. Lucie and Indian River counties, including some areas where head is reduced below land surface. The cumulative effect of pumping from Indian River County Utilities' Oslo wellfield and St. Lucie County Utilities' proposed North wellfield contributes to this simulated effect.

Conclusions

Historical chloride data and the ECFM results indicate that properly designed and managed wellfields appear able to meet projected FAS demands through 2045 in the UEC Planning Area. The planning-level ECFM simulations and analyses conducted to support this 2021 UEC Plan Update are considered conservative and provide insight to potential water level and water quality changes that may occur in the FAS over time if no wellfield design and operations plans are implemented to minimize movement of poor-quality water. The model results identified some isolated potential issues that may require further evaluation. The FAS will continue to provide a substantial and increasing portion of the water needed to meet projected 2045 demands. Water quality should be adequate for all users with reverse osmosis treatment, as needed.

Several FAS wellfields in the UEC Planning Area have experienced some water quality degradation, but current operations have shown this can be managed through appropriate wellfield and treatment plant design and operating protocols. A list of wellfield management activities is provided in **Chapter 8**. In addition, monitor wells can provide early warning of the need for changes to wellfield operations to minimize upconing or lateral movement of poor-quality water.

Next Steps

The assumptions used in the ECFM and the potential issues that require further evaluation should be assessed through a coordinated effort with PS utilities, power generation facilities, and other stakeholders. The following suggestions are provided to guide future efforts to ensure long-term sustainability of the FAS.

FAS users should:

- ◆ Implement wellfield designs and operations that increase the sustainability of the FAS (e.g., additional wells with greater spacing between them, reduced pumping from each well to minimize upconing of poor-quality water).
- ◆ Continue to refine wellfield operational plans and communicate these refinements to the SFWMD for incorporation into future ECFM update efforts.
- ◆ Coordinate FAS drilling and testing programs with SFWMD staff prior to drilling to maximize collection of mutually beneficial data.

The SFWMD will:

- ◆ Continue to coordinate with PS utilities to facilitate long-term management of the FAS.
- ◆ Incorporate additional well construction, aquifer test, lithologic, water level, water quality, and other data into the ECFM from monitor wells, water supply wells, and deep injection wells. Packer test results from confining layers would enhance the ECFM's representation of confining layers.
- ◆ Evaluate the effects of water quality degradation on the sustainability of the FAS for existing legal uses. Considerations may include water quality thresholds for membrane treatment processes, treatment costs, clarification of impact criteria, monitoring guidelines, potential for conflicts with other regulatory programs, and, if warranted, regulatory strategies to maintain the viability of the FAS as a water supply source.

REFERENCES

- Billah M., R. Earle, and U. Bandara. 2021. *Re-Calibration and Application of the East Coast Floridan Model*. South Florida Water Management District. West Palm Beach, FL. August 2021.
- Giddings, J.B., A. Montoya, and L.J. Jurado. 2014. *East Coast Floridan Model*. South Florida Water Management District. West Palm Beach, FL. October 2014.
- Intergovernmental Panel on Climate Change. 2013. *Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change* (Stocker, T.F., D. Qin, G.-K. Plattner, M. Tignor, S.K. Allen, J. Boschung, A. Nauels, Y. Xia, V. Bex, and P.M. Midgley [eds.]). Cambridge University Press, Cambridge, United Kingdom. 1,535 pp.
- SFWMD 2009a. *Climate Change and Water Management in South Florida*. South Florida Water Management District, West Palm Beach, FL. November 2009.
- SFWMD. 2009b. *Water Utilities Water Demand Reduction During the 2007-2009 Water Shortage Restrictions*. South Florida Water Management District, West Palm Beach, FL. September 2009.
- SFWMD. 2011. *Past and Projected Trends in Climate and Sea Level for South Florida*. South Florida Water Management District, West Palm Beach, FL. July 2011. SFWMD. 2021. *Applicant's Handbook for Water Use Permit Applications within the South Florida Water Management District*. South Florida Water Management District, West Palm Beach, FL. March 2021.
- Southeast Florida Regional Climate Change Compact. 2019. *Unified Sea Level Rise Projection Southeast Florida*. 2019 Update. Prepared by the Sea Level Rise Ad Hoc Work Group. 36 pp.
- The Climate Explorer. 2021. *The Climate Explorer*. Available at: <https://crt-climate-explorer.nemac.org/>.

E

Wastewater Treatment Facilities

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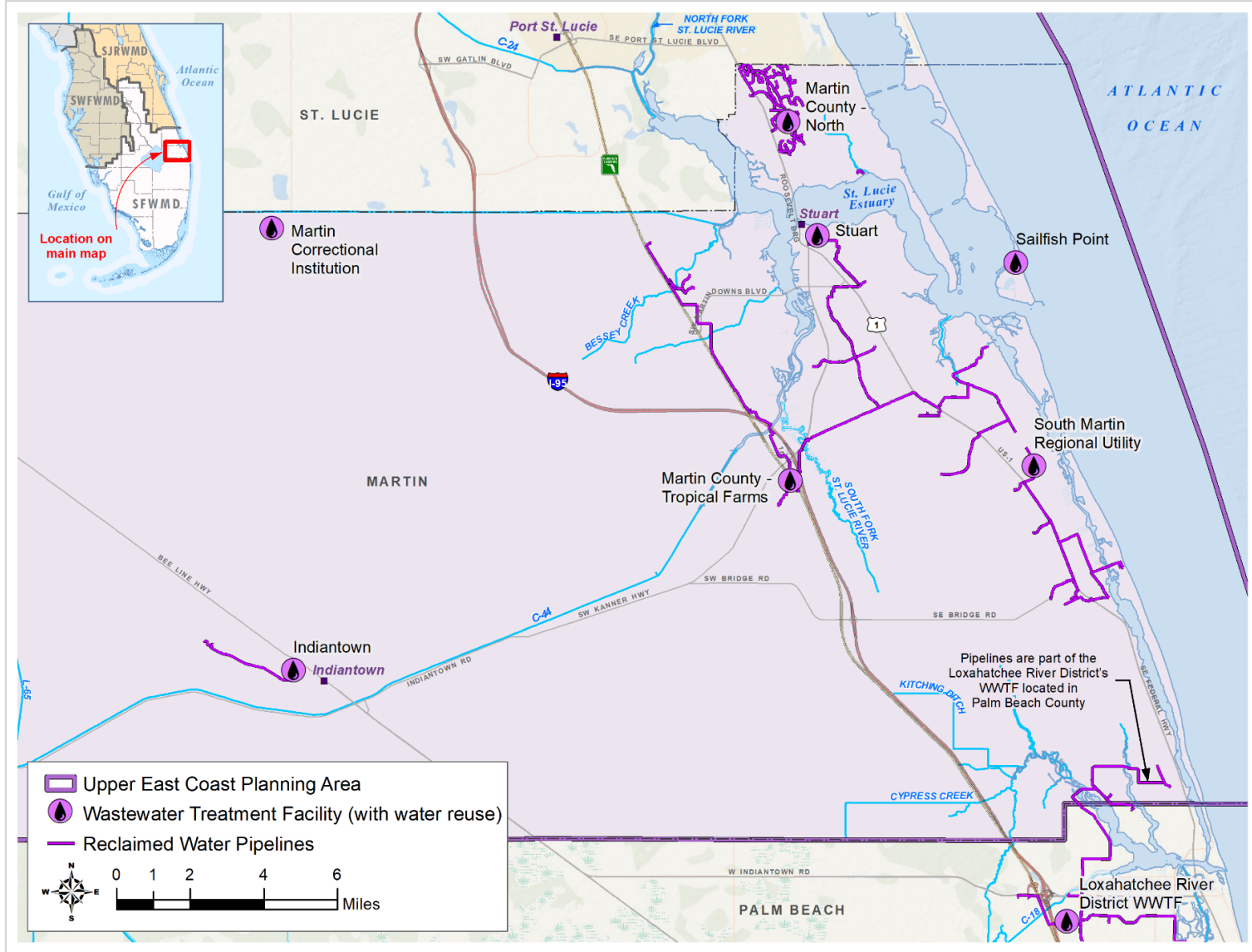
WASTEWATER TREATMENT FACILITIES

Wastewater that is generated by homes and businesses is either directed to an on-site septic tank for treatment and disposal or it is collected via sanitary sewer and conveyed to a wastewater treatment facility (WWTF) for treatment and disposal or reuse. WWTFs can either be smaller “package plants” or larger, more regional, facilities. This appendix focuses on the larger facilities with a Florida Department of Environmental Protection (FDEP) permitted treatment capacity of 0.10 million gallons per day (mgd) or greater. These larger treatment facilities allow economy of operation, reduce risk of treatment upset, and have sufficient flows that if properly treated and reused as reclaimed water could positively impact water resources.

As of 2019, there were 20 domestic WWTFs within the Upper East Coast (UEC) Planning Area with a permitted treatment capacity of 0.10 mgd or greater (**Figures E-1 and E-2**). **Table E-1** lists the WWTFs that reported 2019 annual average daily flows for FDEP’s Reuse Inventory (FDEP 2020) and a summary of the projected 2045 flows. The 2019 and projected 2045 utilization of reclaimed water and methods of disposal for those same facilities are provided in **Tables E-2 and E-3**, respectively.

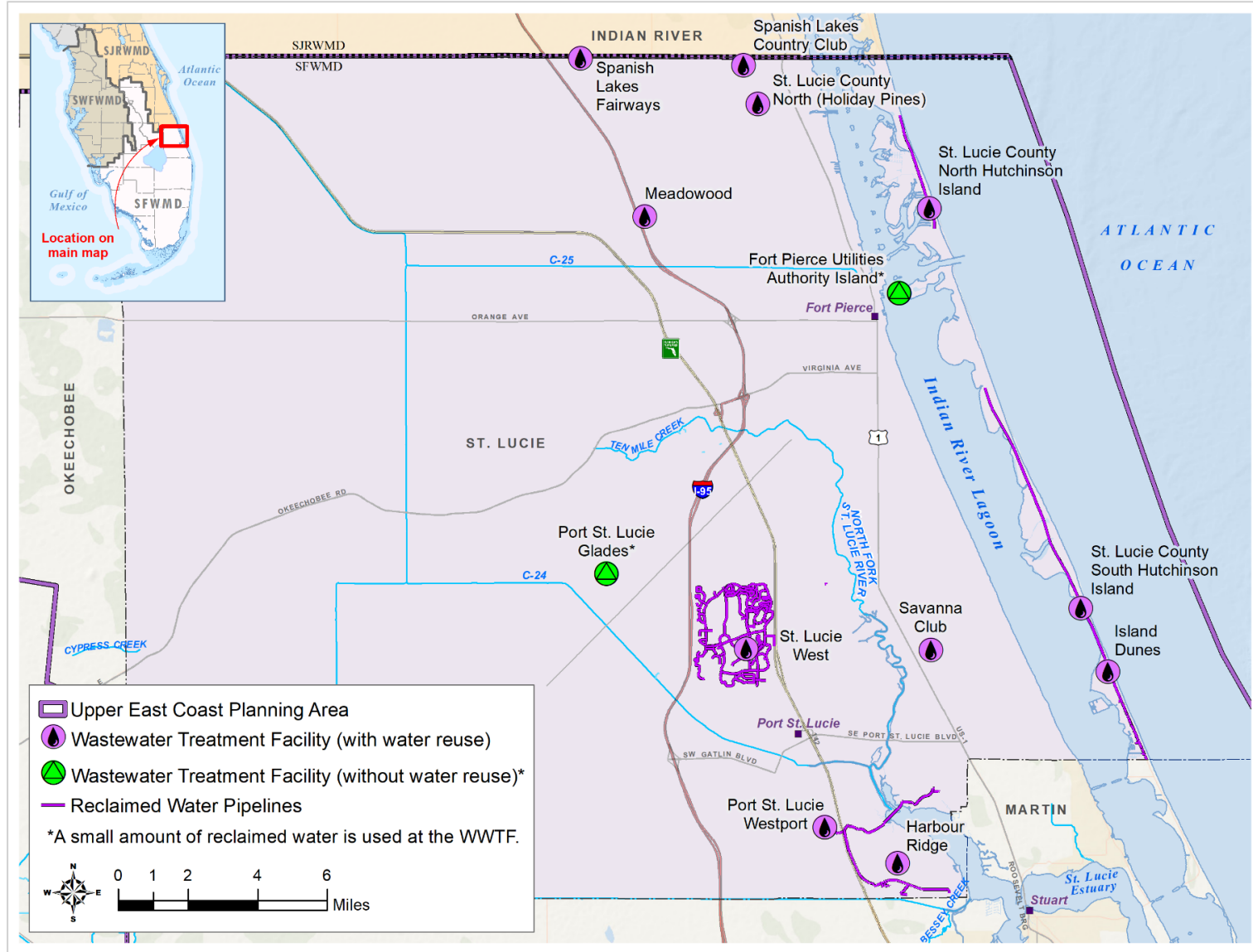
Although the capacity of WWTFs in the UEC Planning Area totals 49.22 mgd, an average of only 24.22 mgd of wastewater was treated in 2019. WWTFs require treatment capacities greater than average daily flows (to meet daily peak flows) to ensure a margin of safety. Regionally, 8.77 mgd (including supplemental water) was reused in 2019. Nearly 90% of that water was used for public access irrigation, which includes irrigation of golf courses, residences, parks, and schools. The remaining amount was reused for groundwater recharge through rapid infiltration basins and for industrial uses or toilet flushing at the WWTF. Almost all treated effluent not reused was disposed of through deep well injection (15.99 mgd). The only exception was a small, infrequent surface water discharge (0.02 mgd).

By 2045, treated wastewater flow is projected to increase 90% over the reported 2019 flows in the UEC Planning Area. Water reuse flows in the planning area are projected to increase nearly 300%, primarily driven by increases in water reuse at larger WWTFs.



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Figure E-1. Wastewater treatment facilities in Martin County with a permitted capacity of 0.10 mgd or greater.



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Figure E-2. Wastewater treatment facilities in St. Lucie County with a permitted capacity of 0.10 mgd or greater.

Table E-1. Summary of 2019 and 2045 wastewater treatment facilities with current or expected capacities of 0.10 mgd or greater in the UEC Planning Area.

County	Facility	FDEP Rated WWTF Capacity (mgd)	2019 ^a			2045		
			Average Daily WWTF Flow (mgd)	Average Daily Reuse Flow (mgd)	Reuse Percentage ^b	Average Daily WWTF Flow (mgd)	Average Daily Reuse Flow (mgd)	Reuse Percentage ^b
Martin	Indiantown, Village of (FLA029939)	0.75	0.24	0.24	100%	0.32	0.32	100%
	Martin Correctional Institution (FLA013881)	0.37	0.32	0.32	100%	0.28	0.28	100%
	Martin County – North (FLA043192)	2.76	1.56	0.69	44%	1.94	0.86	44%
	Martin County – Tropical Farms (FL0043214)	5.90	3.04	1.75	57%	3.78	2.17	57%
	Sailfish Point (FLA017466)	0.25	0.08	0.08	100%	0.08	0.08	100%
	South Martin Regional Utility (FLA013859)	1.40	0.81	0.89 ^c	100%	1.65	1.16	70%
	Stuart, City of (FLA041459)	4.00	1.89	0.27	14%	3.60	1.48	41%
	Martin County Subtotal (7 facilities)	15.43	7.94	4.24	53%	11.65	6.35	55%
St. Lucie	Fort Pierce Utilities Authority – Island (FL0027278) ^d	10.00	4.23	0.06	1%	--	--	--
	Fort Pierce Utilities Authority – Mainland (proposed)	--	--	--	--	4.96	2.48	50%
	Harbour Ridge (FLA013986)	0.12	0.07	0.07	100%	0.07	0.07	100%
	Island Dunes (FLA013980)	0.12	0.04	0.04	100%	0.04	0.04	100%
	Meadowood (FLA013982)	0.11	0.06	0.06	100%	0.05	0.05	100%
	Port St. Lucie, City of – Glades (FLA326321)	12.00	5.22	0.31	6%	17.10	13.20	77%
	Port St. Lucie, City of – Westport (FLA139653)	6.00	4.33	1.20	28%	5.40	5.40	100%
	Savanna Club (FLA013958)	0.15	0.05	0.05	100%	0.06	0.06	100%
	Spanish Lakes Country Club (FLA013977)	0.16	0.09	0.09	100%	0.10	0.10	100%
	Spanish Lakes Fairways (FLA013998)	0.25	0.15	0.15	100%	0.15	0.15	100%
	St. Lucie County – North (Holiday Pines) (FLA013969) ^e	0.30	0.13	0.13	100%	--	--	--
	St. Lucie County – North County Regional (proposed) ^f	--	--	--	--	4.00	3.00	75%
	St. Lucie County – North Hutchinson Island (FLA013946)	0.85	0.24	0.24	100%	0.24	0.24	100%
	St. Lucie County – South Hutchinson Island (FL0139475)	1.60	0.29	0.27	93%	0.29	0.27	93%
	St. Lucie West Services District (FLA013993)	2.13	1.38	1.86 ^c	100%	2.02	2.97 ^c	100%
	St. Lucie County Subtotal (13 facilities)	33.79	16.28	4.53	28%	34.48	28.03	81%
UEC Planning Area Total (20 facilities)		49.22	24.22	8.77	36%	46.13	34.38	75%

FDEP = Florida Department of Environmental Protection; mgd = million gallons per day; UEC = Upper East Coast; WWTF = wastewater treatment facility.

^a As reported in the 2019 Reuse Inventory (FDEP 2020).

^b Reuse percentage is calculated by dividing Reuse Flow (including any supplemental flow) by WWTF Flow; not to exceed 100%.

^c Includes supplemental water.

^d To be decommissioned when the Mainland WWTF comes online.

^e To be decommissioned when the North County Regional WWTF comes online.

^f Future flows based on an estimated WWTF treatment capacity of 4.00 mgd.

Table E-2. 2019 and 2045 utilization of reclaimed water (in mgd) from wastewater treatment facilities in the UEC Planning Area with current or expected capacities of 0.10 mgd or greater (From: FDEP 2020).

Facility	2019					2045				
	Residential Irrigation	Golf Course Irrigation	Other Irrigation ^a	Groundwater Recharge ^b	Other Types of Reuse ^c	Residential Irrigation	Golf Course Irrigation	Other Irrigation ^a	Groundwater Recharge ^b	Other Types of Reuse ^c
Martin County										
Indiantown, Village of	0.00	0.00	0.00	0.21	0.03	0.00	0.00	0.00	0.32	0.00
Martin Correctional Institution	0.00	0.00	0.14	0.00	0.18	0.00	0.00	0.10	0.00	0.18
Martin County – North	0.22	0.42	0.05	0.00	0.00	0.28	0.52	0.06	0.00	0.00
Martin County – Tropical Farms	0.18	1.46	0.11	0.00	0.00	0.22	1.82	0.13	0.00	0.00
Sailfish Point	0.00	0.08	0.00	0.00	0.00	0.00	0.08	0.00	0.00	0.00
South Martin Regional Utility	0.06	0.69	0.13	0.00	0.01	0.09	0.94	0.13	0.00	0.00
Stuart, City of	0.00	0.00	0.27	0.00	0.00	0.00	1.38	0.10	0.00	0.00
Martin County Subtotal	0.46	2.65	0.70	0.21	0.22	0.59	4.74	0.52	0.32	0.18
St. Lucie County										
Fort Pierce Utilities Authority – Island ^d	0.00	0.00	0.00	0.00	0.06	--	--	--	--	--
Fort Pierce Utilities Authority – Mainland (proposed)	--	--	--	--	--	0.00	0.00	2.48	0.00	0.00
Harbour Ridge	0.00	0.07	0.00	0.00	0.00	0.00	0.07	0.00	0.00	0.00
Island Dunes	0.00	0.04	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.00
Meadowood	0.00	0.06	0.00	0.00	0.00	0.00	0.05	0.00	0.00	0.00
Port St. Lucie, City of – Glades	0.00	0.00	0.00	0.00	0.31	4.40	4.40	4.40	0.00	0.00
Port St. Lucie, City of – Westport	0.00	1.20	0.00	0.00	0.00	1.80	1.80	1.80	0.00	0.00
Savanna Club	0.00	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.06	0.00
Spanish Lakes Country Club	0.00	0.00	0.00	0.00	0.09	0.00	0.00	0.00	0.00	0.10
Spanish Lakes Fairways	0.00	0.11	0.00	0.04	0.00	0.00	0.11	0.00	0.04	0.00
St. Lucie County – North (Holiday Pines) ^e	0.00	0.07	0.00	0.06	0.00	--	--	--	--	--
St. Lucie County – North County Regional (proposed) ^f	--	--	--	--	--	1.00	1.00	1.00	0.00	0.00
St. Lucie County – North Hutchinson Island	0.23	0.00	0.01	0.00	0.00	0.23	0.00	0.01	0.00	0.00
St. Lucie County – South Hutchinson Island	0.27	0.00	0.00	0.00	0.00	0.27	0.00	0.00	0.00	0.00
St. Lucie West Services District	1.76	0.10	0.00	0.00	0.00	2.04	0.12	0.81	0.00	0.00
St. Lucie County Subtotal	2.26	1.65	0.01	0.15	0.46	9.74	7.59	10.50	0.10	0.10
UEC Planning Area Total	2.72	4.30	0.71	0.36	0.68	10.33	12.33	11.02	0.42	0.28

FDEP = Florida Department of Environmental Protection; mgd = million gallons per day; UEC = Upper East Coast; WWTF = wastewater treatment facility.

^a Other irrigation includes parks, schools, common areas, etc.

^b Groundwater recharge includes rapid infiltration basins and percolation ponds.

^c Other types of reuse include other permitted uses, such as process water at the treatment facility, cooling water, toilet flushing, and absorption fields.

^d To be decommissioned when the Mainland WWTF comes online.

^e To be decommissioned when the North County Regional WWTF comes online.

^f Future reclaimed water flows based on 75% reuse of 4.00 mgd of wastewater treated, split evenly among irrigation types.

Table E-3. 2019 and 2045 methods of wastewater disposal for facilities with current or expected capacities of 0.10 mgd or greater in the UEC Planning Area (From: FDEP 2020).

Facility	2019		2045	
	Deep Well Injection (mgd)	Surface Water Discharge (mgd)	Deep Well Injection (mgd)	Surface Water Discharge (mgd)
Martin County				
Indiantown, Village of	0.00	0.00	0.00	0.00
Martin Correctional Institution	0.00	0.00	0.00	0.00
Martin County – North	0.87	0.00	1.08	0.00
Martin County – Tropical Farms	1.29	0.00	1.61	0.00
Sailfish Point	0.00	0.00	0.00	0.00
South Martin Regional Utility	0.00	0.00	0.00	0.00
Stuart, City of	1.62	0.00	2.10	0.00
Martin County Subtotal	3.78	0.00	4.79	0.00
St. Lucie County				
Fort Pierce Utilities Authority – Island ^a	4.17	0.00	--	--
Fort Pierce Utilities Authority – Mainland (proposed)	--	--	2.48	0.00
Harbour Ridge	0.00	0.00	0.00	0.00
Island Dunes	0.00	0.00	0.00	0.00
Meadowood	0.00	0.00	0.00	0.00
Port St. Lucie, City of – Glades	4.91	0.00	3.90	0.00
Port St. Lucie, City of – Westport	3.13	0.00	0.00	0.00
Savanna Club	0.00	0.00	0.00	0.00
Spanish Lakes Country Club	0.00	0.00	0.00	0.00
Spanish Lakes Fairways	0.00	0.00	0.00	0.00
St. Lucie County – North (Holiday Pines) ^b	0.00	0.00	--	--
St. Lucie County – North County Regional (proposed)	--	--	1.00 ^c	0.00
St. Lucie County – North Hutchinson Island	0.00	0.00	0.00	0.00
St. Lucie County – South Hutchinson Island	0.00	0.02 ^d	0.00	0.02 ^e
St. Lucie West Services District	0.00	0.00	0.00	0.00
St. Lucie County Subtotal	12.21	0.02	7.38	0.02
UEC Planning Area Total	15.99	0.02	12.17	0.02

FDEP = Florida Department of Environmental Protection; mgd = million gallons per day; UEC = Upper East Coast; WWTF = wastewater treatment facility.

^a To be decommissioned when the Mainland WWTF comes online.

^b To be decommissioned when the North County Regional WWTF comes online.

^c Future flow based on 75% reuse of 4.00 mgd of wastewater treated, with the remainder disposed of through deep well injection.

^d Discharge to Florida Power & Light's cooling canal that flows to the ocean.

^e Discharge to Florida Power & Light's cooling canal, based on 2019 flow.

WASTEWATER/REUSE FACILITY PROFILES

This section contains profiles for each of the wastewater/reuse facilities within the UEC Planning Area with a treatment capacity of 0.10 mgd or greater. The profiles are organized by county, then alphabetically by utility, development, or institution. Each profile contains the existing facility information, followed by the current (2019) and projected (2045) annual average daily flows of wastewater and reclaimed water. Existing capacity and flow information was obtained from the 2019 Reuse Inventory (FDEP 2020). Projected flows are based on information obtained from the utility, estimates of population growth in the service area, or assumptions of buildout.



Reclaimed Water Pump

VILLAGE OF INDIANTOWN

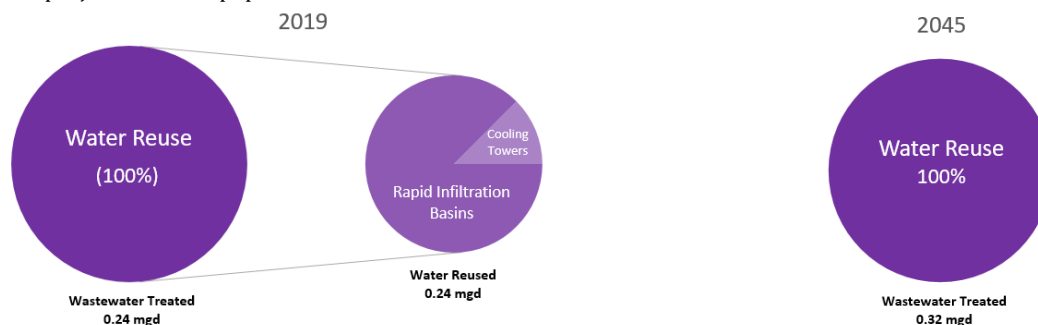
Description: The WWTF is located at 14843 SW 168th Avenue, Indiantown, Florida. The facility's operational permit was transferred from the Indiantown Company to the Village of Indiantown in June 2020. The WWTF provides wastewater services to approximately 1,800 residences and businesses in the village. Reclaimed water from the facility is sent to on-site rapid infiltration basins for recharge. Until 2019, reclaimed water was also sent to the Indiantown Cogeneration Plant's cooling towers. However, the power plant is scheduled to be decommissioned and no longer receives reclaimed water.

Wastewater Treatment Facility Information			
FDEP Water Facilities Regulation Identification	FLA029939		
Wastewater Treatment Capacity (mgd)	0.75		
Disinfection ^a	Basic to RIBs; High-level to cooling towers		
Water Reuse?	Yes		
Public Access UsersServed:			
Residences	0		
Golf Courses	0		
Parks and Schools	0		
Facility Flows (mgd)			
	2019	2045 ^b	
Total Wastewater Treated	0.24	0.32	
Total Wastewater Disposed	0.00	0.00	
Deep Injection Well	0.00	0.00	
Surface Water	0.00	0.00	
Total Water Reused	0.24	0.32	
Residential Irrigation	0.00	0.00	
Golf Course Irrigation	0.00	0.00	
Other Irrigation	0.00	0.00	
Groundwater Recharge (RIBs)	0.21	0.32	
Industrial	0.03	0.00	
Wetlands	0.00	0.00	
Other	0.00	0.00	
Supplemental to Reclaimed Water (type)	0.00	0.00	
Reuse Percentage	100%	100%	
Reclaimed Water Project Summary			
Project Name	Completion Date	Total Capital Cost (\$ million)	Added Capacity (mgd)
No Projects	--	--	--

WWTF = wastewater treatment facility; FDEP = Florida Department of Environmental Protection; mgd = million gallons per day; RIB = rapid infiltration basin.

^a Basic disinfection as described in Rule 62-600.440(4), F.A.C. and High-level disinfection as described in Rule 62-600.440(5), F.A.C.

^b Based on a projected 32.8% population increase within the service area from 2019 to 2045.



MARTIN COUNTY CORRECTIONAL INSTITUTION

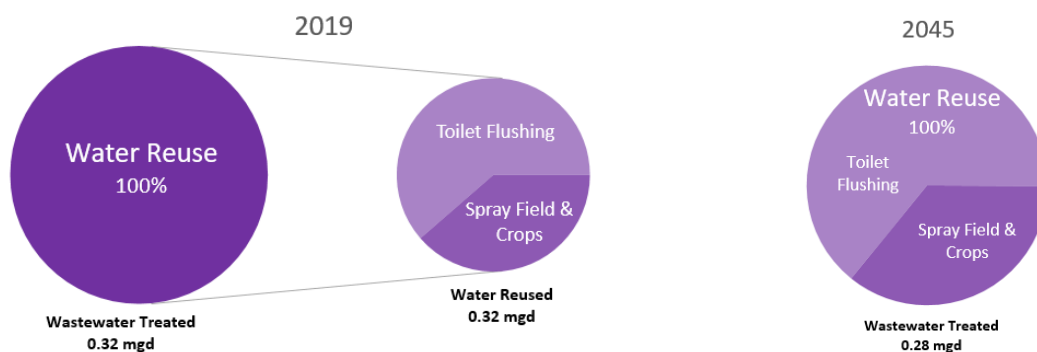
Description: The WWTF is located at 1150 SW Allapattah Road, Indiantown, Florida. The treatment facility provides wastewater services to Martin County Correctional Institution. Most of the reclaimed water is used for toilet flushing and laundry. The remaining reclaimed water is used on a spray field or for crops. A lined pond is available for emergency flow.

Wastewater Treatment Facility Information			
FDEP Water Facilities Regulation Identification		FLA013881	
Wastewater Treatment Capacity (mgd)		0.37	
Disinfection ^a		High-level	
Water Reuse?		Yes	
Public Access Users Served:			
Residences		0	
Golf Courses		0	
Parks and Schools		0	
Facility Flows (mgd)			
		2019	2045 ^b
Total Wastewater Treated		0.32	0.28
Total Wastewater Disposed		0.00	0.00
Deep Injection Well		0.00	0.00
Surface Water		0.00	0.00
Total Water Reused		0.32	0.28
Residential Irrigation		0.00	0.00
Golf Course Irrigation		0.00	0.00
Other Irrigation		0.14	0.10
Groundwater Recharge (RIBs)		0.00	0.00
Industrial		0.00	0.00
Wetlands		0.00	0.00
Other		0.18	0.18
Supplemental to Reclaimed Water (type)		0.00	0.00
Reuse Percentage		100%	100%
Reclaimed Water Project Summary			
Project Name	Completion Date	Total Capital Cost (\$ million)	Added Capacity (mgd)
No Projects	--	--	--

WWTF = wastewater treatment facility; FDEP = Florida Department of Environmental Protection; mgd = million gallons per day; RIB = rapid infiltration basin.

^a High-level disinfection as described in Rule 62-600.440(5), F.A.C.

^b Wastewater flows at the correctional institution are not projected to increase. Projections are based on previous 5 years (2015 to 2019) of reported flows in the FDEP Reuse Inventory.



MARTIN COUNTY – NORTH

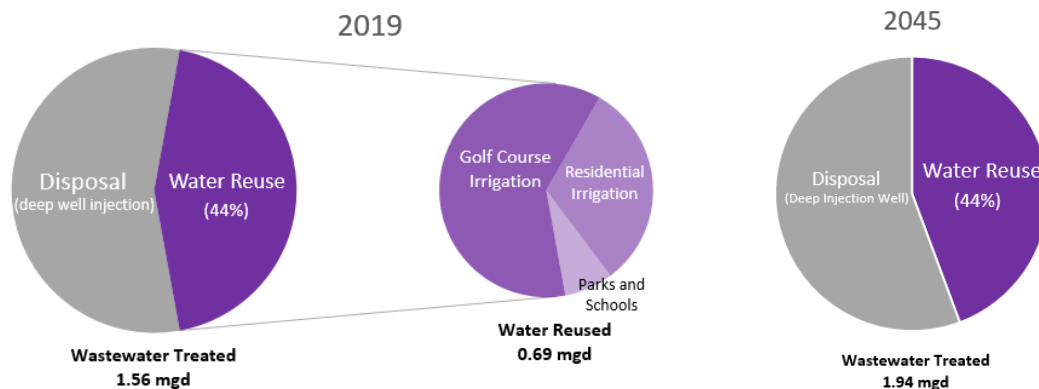
Description: The WWTF is located at 3100 NW Hillman Drive, Jensen Beach, Florida. The treatment facility provides reclaimed water for irrigation of a golf course, residences, a park, and a school. Treated wastewater that is not reused is disposed of through an on-site deep injection well.

Wastewater Treatment Facility Information			
FDEP Water Facilities Regulation Identification		FLA043192	
Wastewater Treatment Capacity (mgd)		2.76	
Disinfection ^a		High-level	
Water Reuse?		Yes	
Public Access Users Served:			
Residences		1,000	
Golf Courses		1	
Parks and Schools		2	
Facility Flows (mgd)			
		2019	2045 ^b
Total Wastewater Treated		1.56	1.94
Total Wastewater Disposed		0.87	1.08
Deep Injection Well		0.87	1.08
Surface Water		0.00	0.00
Total Water Reused		0.69	0.86
Residential Irrigation		0.22	0.28
Golf Course Irrigation		0.42	0.52
Other Irrigation		0.05	0.06
Groundwater Recharge (RIBs)		0.00	0.00
Industrial		0.00	0.00
Wetlands		0.00	0.00
Other		0.00	0.00
Supplemental to Reclaimed Water (type)		0.00	0.00
Reuse Percentage		44%	44%
Reclaimed Water Project Summary			
Project Name	Completion Date	Total Capital Cost (\$ million)	Added Capacity (mgd)
No Projects	--	--	--

WWTF = wastewater treatment facility; FDEP = Florida Department of Environmental Protection; mgd = million gallons per day; RIB = rapid infiltration basin.

^a High-level disinfection as described in Rule 62-600.440(5), F.A.C.

^b Based on a projected 24.5% population increase within the service area from 2019 to 2045.



MARTIN COUNTY – TROPICAL FARMS

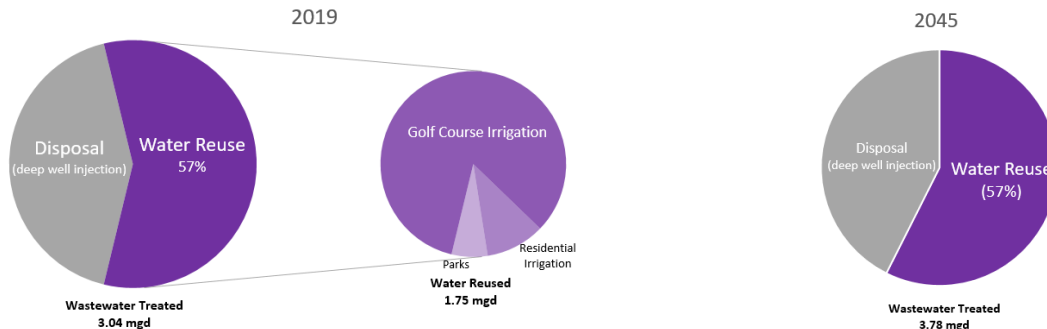
Description: The WWTF is located at 8595 SW Kansas Avenue, Stuart, Florida. The treatment facility provides reclaimed water for irrigation of golf courses, residences, and one park. In some cases, reclaimed water is delivered to golf course lakes for irrigation: two lakes at the Florida Club Golf Course, one at the Tower Golf Course, and one at the Willoughby Golf Course. Three surficial aquifer system wells at Martin Downs are available to supplement the supply of reclaimed water. Treated wastewater not reused is disposed of through deep well injection.

Wastewater Treatment Facility Information			
FDEP Water Facilities Regulation Identification	FL0043214		
Wastewater Treatment Capacity (mgd)	5.90		
Disinfection ^a	High-level		
Water Reuse?	Yes		
Public Access UsersServed:			
Residences	250		
Golf Courses	8		
Parks and Schools	1		
Facility Flows (mgd)			
	2019	2045 ^b	
Total Wastewater Treated	3.04	3.78	
Total Wastewater Disposed	1.29	1.61	
Deep Injection Well	1.29	1.61	
Surface Water	0.00	0.00	
Total Water Reused	1.75	2.17	
Residential Irrigation	0.18	0.22	
Golf Course Irrigation	1.46	1.82	
Other Irrigation	0.11	0.13	
Groundwater Recharge (RIBs)	0.00	0.00	
Industrial	0.00	0.00	
Wetlands	0.00	0.00	
Other	0.00	0.00	
Supplemental to Reclaimed Water (type)	0.00	0.00	
Reuse Percentage	57%	57%	
Reclaimed Water Project Summary			
Project Name	Completion Date	Total Capital Cost (\$ million)	Added Capacity (mgd)
No Projects	--	--	--

WWTF = wastewater treatment facility; FDEP = Florida Department of Environmental Protection; mgd = million gallons per day; RIB = rapid infiltration basin.

^a High-level disinfection as described in Rule 62-600.440(5), F.A.C.

^b Based on a projected 24.5% population increase within the service area from 2019 to 2045.



SAILFISH POINT

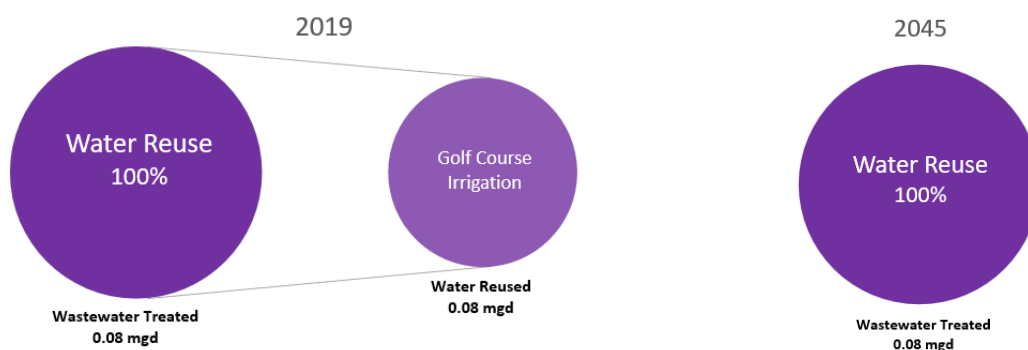
Description: The WWTF is located at 6929 SE North Marina Way, Stuart, Florida. The treatment facility provides reclaimed water for irrigation of the Sailfish Point Golf Course. Any treated wastewater from the facility that does not meet standards is diverted to an on-site storage tank, then pumped back to the facility headworks. The facility and service area are at buildout; no growth is expected.

Wastewater Treatment Facility Information			
FDEP Water Facilities Regulation Identification	FLA017466		
Wastewater Treatment Capacity (mgd)	0.25		
Disinfection ^a	High-level		
Water Reuse?	Yes		
Public Access Users Served:			
Residences	0		
Golf Courses	1		
Parks and Schools	0		
Facility Flows (mgd)			
	2019	2045 ^b	
Total Wastewater Treated	0.08	0.08	
Total Wastewater Disposed	0.00	0.00	
Deep Injection Well	0.00	0.00	
Surface Water	0.00	0.00	
Total Water Reused	0.08	0.08	
Residential Irrigation	0.00	0.00	
Golf Course Irrigation	0.08	0.08	
Other Irrigation	0.00	0.00	
Groundwater Recharge (RIBs)	0.00	0.00	
Industrial	0.00	0.00	
Wetlands	0.00	0.00	
Other	0.00	0.00	
Supplemental to Reclaimed Water (type)	0.00	0.00	
Reuse Percentage	100%	100%	
Reclaimed Water Project Summary			
Project Name	Completion Date	Total Capital Cost (\$ million)	Added Capacity (mgd)
No Projects	--	--	--

WWTF = wastewater treatment facility; FDEP = Florida Department of Environmental Protection; mgd = million gallons per day; RIB = rapid infiltration basin.

^a High-level disinfection as described in Rule 62-600.440(5), F.A.C.

^b Service area is at buildout. Projections are based on previous 5 years (2015 to 2019) of reported flows in the FDEP Reuse Inventory.



SOUTH MARTIN REGIONAL UTILITY

Description: The WWTF is located at 8181 SE Skylark Avenue, Hobe Sound, Florida. The treatment facility provides reclaimed water to irrigate golf courses, schools, and residences. If needed, reclaimed water that is not reused can be applied to two on-site percolation ponds (rapid infiltration basins).

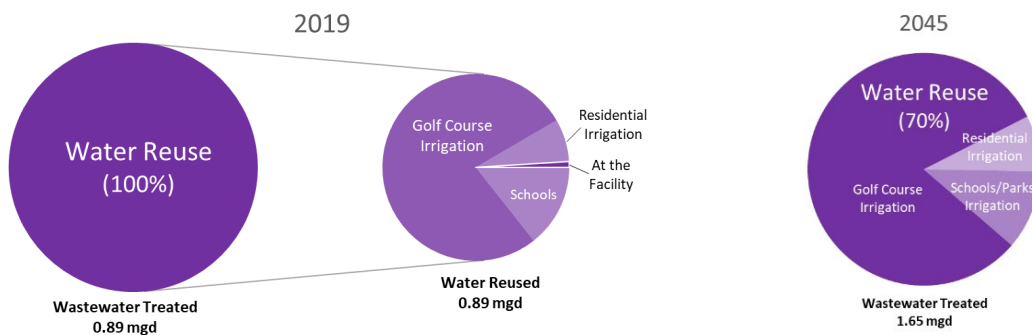
Wastewater Treatment Facility Information			
FDEP Water Facilities Regulation Identification	FLA013859		
Wastewater Treatment Capacity (mgd)	1.40		
Disinfection ^a	High-level		
Water Reuse?	Yes		
Public Access Users Served:			
Residences	75		
Golf Courses	4		
Parks and Schools	1		
Facility Flows (mgd)			
	2019	2045 ^b	
Total Wastewater Treated	0.81	1.65	
Total Wastewater Disposed	0.00	0.00	
Deep Injection Well	0.00	0.00	
Surface Water	0.00	0.00	
Total Water Reused	0.89^c	1.16	
Residential Irrigation	0.06	0.09	
Golf Course Irrigation	0.69	0.94	
Other Irrigation	0.13	0.13	
Groundwater Recharge (RIBs)	0.00	0.00	
Industrial	0.01	0.00	
Wetlands	0.00	0.00	
Other	0.00	0.00	
Supplemental to Reclaimed Water (type)	0.08	0.00	
Reuse Percentage	100%	70%	
Reclaimed Water Project Summary			
Project Name	Completion Date	Total Capital Cost (\$ million)	Added Capacity (mgd)
Expand reclaimed water treatment capacity – phase 2	12/31/2026	1.26	0.20

WWTF = wastewater treatment facility; FDEP = Florida Department of Environmental Protection; mgd = million gallons per day; RIB = rapid infiltration basin.

^a High-level disinfection as described in Rule 62-600.440(5), F.A.C.

^b Data provided by the utility.

^c Total reuse is greater than total wastewater treated due to additional supplemental groundwater use.



CITY OF STUART

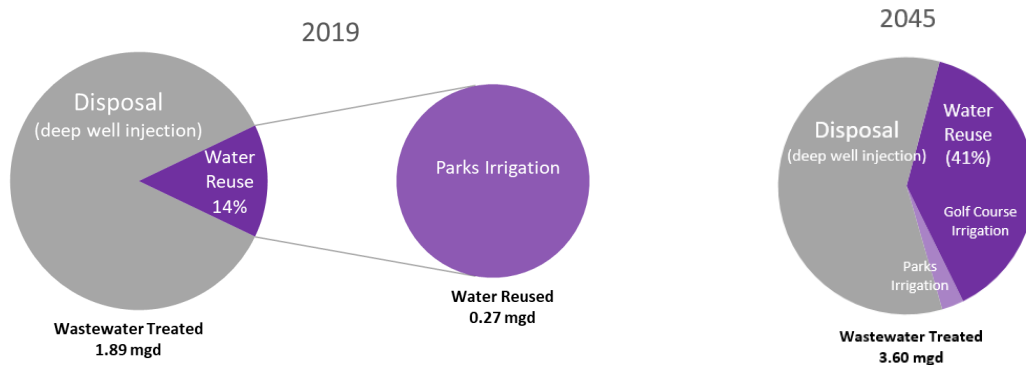
Description: The WWTF is located at 301 SE Stypmann Boulevard, Stuart, Florida. The treatment facility is permitted to provide reclaimed water for public access irrigation, including golf courses, parks, and schools. At this time, irrigation with reclaimed water is used solely for irrigation of parks. Treated water that is not reused is disposed of through deep well injection.

Wastewater Treatment Facility Information			
FDEP Water Facilities Regulation Identification	FLA041459		
Wastewater Treatment Capacity (mgd)	4.00		
Disinfection ^a	High-level		
Water Reuse?	Yes		
Public Access Users Served:			
Residences	0		
Golf Courses	0		
Parks and Schools	4		
Facility Flows (mgd)			
	2019	2045 ^b	
Total Wastewater Treated	1.89	3.60	
Total Wastewater Disposed	1.62	2.10	
Deep Injection Well	1.62	2.10	
Surface Water	0.00	0.00	
Total Water Reused	0.27	1.48	
Residential Irrigation	0.00	0.00	
Golf Course Irrigation	0.00	1.38	
Other Irrigation	0.27	0.10	
Groundwater Recharge (RIBs)	0.00	0.00	
Industrial	0.00	0.00	
Wetlands	0.00	0.00	
Other	0.00	0.00	
Supplemental to Reclaimed Water (type)	0.00	0.00	
Reuse Percentage	14%	41%	
Reclaimed Water Project Summary			
Project Name	Completion Date	Total Capital Cost (\$ million)	Added Capacity (mgd)
No Projects	--	--	--

WWTF = wastewater treatment facility; FDEP = Florida Department of Environmental Protection; mgd = million gallons per day; RIB = rapid infiltration basin.

^a High-level disinfection as described in Rule 62-600.440(5), F.A.C.

^b Data provided by the utility.



FORT PIERCE UTILITIES AUTHORITY – ISLAND

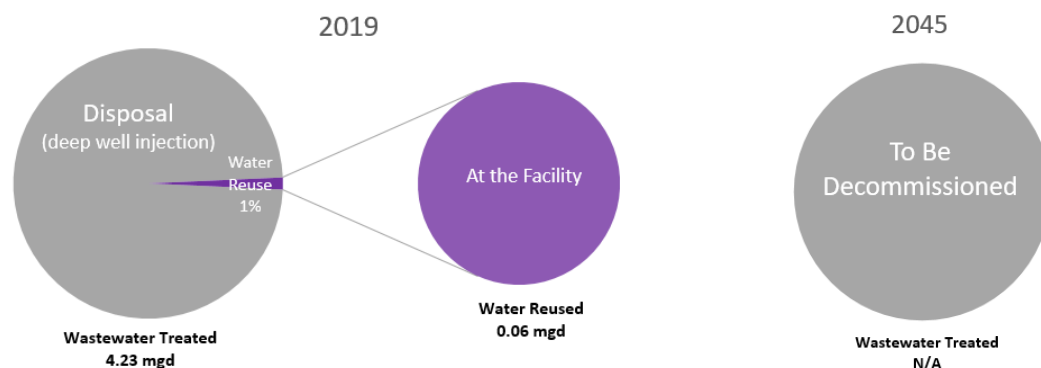
Description: The WWTF is located at 403 Seaway Drive, Fort Pierce, Florida. Treated effluent from the facility is disposed of through deep well injection. Infrequently during testing, discharge is permitted to the Indian River Lagoon. A small amount of the treated water is used at the facility for industrial purposes. The new Mainland WWTF is expected to replace the existing Island facility by 2045.

Wastewater Treatment Facility Information			
FDEP Water Facilities Regulation Identification	FL0027278		
Wastewater Treatment Capacity (mgd)	10.00		
Disinfection ^a	Basic		
Water Reuse?	Yes		
Public Access UsersServed:			
Residences	0		
Golf Courses	0		
Parks and Schools	0		
Facility Flows (mgd)			
	2019	2045 ^b	
Total Wastewater Treated	4.23	--	
Total Wastewater Disposed	4.17	--	
Deep Injection Well	4.17	--	
Surface Water	0.00	--	
Total Water Reused	0.06	--	
Residential Irrigation	0.00	--	
Golf Course Irrigation	0.00	--	
Other Irrigation	0.00	--	
Groundwater Recharge (RIBs)	0.00	--	
Industrial (at the facility)	0.06	--	
Wetlands	0.00	--	
Other	0.00	--	
Supplemental to Reclaimed Water (type)	0.00	--	
Reuse Percentage	1%	--	
Reclaimed Water Project Summary			
Project Name	Completion Date	Total Capital Cost (\$ million)	Added Capacity (mgd)
No Projects			

FDEP = Florida Department of Environmental Protection; mgd = million gallons per day; RIB = rapid infiltration basin; WWTF = wastewater treatment facility.

^a Basic disinfection as described in Rule 62-600.440(4), F.A.C.

^b The proposed Mainland WWTF is expected to replace the existing Island WWTF by 2045.



FORT PIERCE UTILITIES AUTHORITY – MAINLAND (PROPOSED)

Description: The new Mainland WWTF is expected to replace the existing Island facility by 2045. The WWTF is expected to have a wastewater treatment capacity of 7.00 mgd and a reclaimed water production capacity of 3.00 mgd. The location of the facility is currently under consideration.

Wastewater Treatment Facility Information			
FDEP Water Facilities Regulation Identification	--		
Wastewater Treatment Capacity (mgd)	7.00		
Disinfection	-		
Water Reuse?	Yes		
Public Access Users Served:			
Residences	--		
Golf Courses	--		
Parks and Schools	--		
Facility Flows (mgd)			
	2019	2045	
Total Wastewater Treated	--	4.96^a	
Total Wastewater Disposed	--	2.48^b	
Deep Injection Well	--	2.48	
Surface Water	--	0.00	
Total Water Reused	--	2.48^b	
Residential Irrigation	--	0.00	
Golf Course Irrigation	--	0.00	
Other Irrigation	--	2.48	
Groundwater Recharge (RIBs)	--	0.00	
Industrial (at the facility)	--	0.00	
Wetlands	--	0.00	
Other	--	0.00	
Supplemental to Reclaimed Water (type)	--	0.00	
Reuse Percentage	--	50%	
Reclaimed Water Project Summary			
Project Name	Completion Date	Total Capital Cost (\$ million)	Added Capacity (mgd)
No Projects	--	--	--

FDEP = Florida Department of Environmental Protection; mgd = million gallons per day; RIB = rapid infiltration basin; WWTF = wastewater treatment facility.

^a Based on a projected 17.2% population increase within the service area (currently served by the Island WWTF) from 2019 to 2045.

^b It is assumed that 50% of treated wastewater will be reused, with the remainder disposed of through deep well injection.



HARBOUR RIDGE

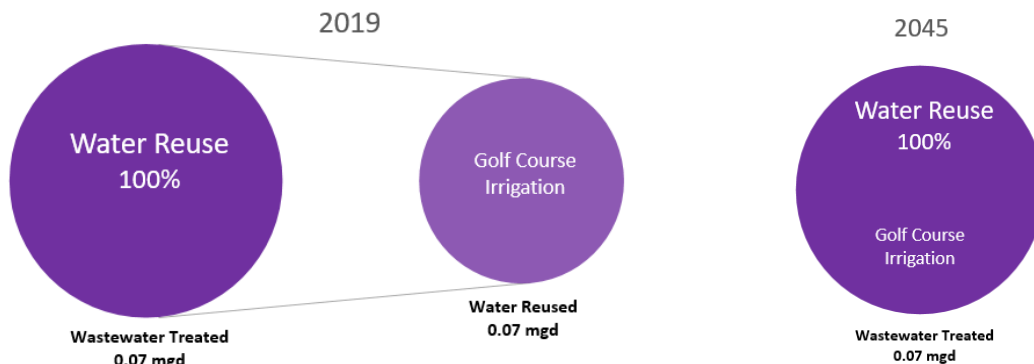
Description: The WWTF is located at 12600 Harbour Ridge Boulevard, Palm City, Florida. The treatment facility provides reclaimed water to a holding pond used for irrigation of the Harbour Ridge Golf Course. If needed, the treated wastewater can be diverted to an on-site percolation pond (rapid infiltration basin).

Wastewater Treatment Facility Information			
FDEP Water Facilities Regulation Identification	FLA013986		
Wastewater Treatment Capacity (mgd)	0.12		
Disinfection ^a	High-level		
Water Reuse?	Yes		
Public Access Users Served:			
Residences	0		
Golf Courses	2		
Parks and Schools	0		
Facility Flows (mgd)			
	2019	2045 ^b	
Total Wastewater Treated	0.07	0.07	
Total Wastewater Disposed	0.00	0.00	
Deep Injection Well	0.00	0.00	
Surface Water	0.00	0.00	
Total Water Reused	0.07	0.07	
Residential Irrigation	0.00	0.00	
Golf Course Irrigation	0.07	0.07	
Other Irrigation	0.00	0.00	
Groundwater Recharge (RIBs)	0.00	0.00	
Industrial	0.00	0.00	
Wetlands	0.00	0.00	
Other	0.00	0.00	
Supplemental to Reclaimed Water (type)	0.00	0.00	
Reuse Percentage	100%	100%	
Reclaimed Water Project Summary			
Project Name	Completion Date	Total Capital Cost (\$ million)	Added Capacity (mgd)
No Projects	--	--	--

WWTF = wastewater treatment facility; FDEP = Florida Department of Environmental Protection; mgd = million gallons per day; RIB = rapid infiltration basin.

^a High-level disinfection as described in Rule 62-600.440(5), F.A.C.

^b Service area is assumed to be at buildout. Projections are based on previous 5 years (2015 to 2019) of reported flows in the FDEP Reuse Inventory.



ISLAND DUNES

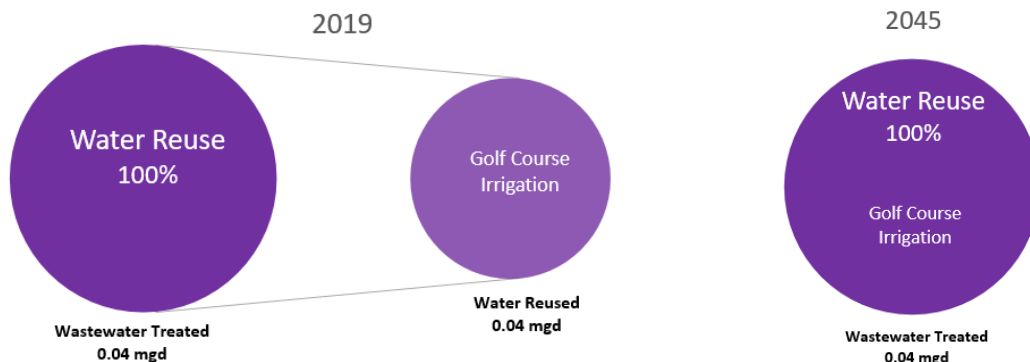
Description: The WWTF is located at 8735 South Ocean Drive, Jensen Beach, Florida. The treatment facility provides reclaimed water to a lined storage pond that is used to irrigate the Island Dunes Golf Course. If necessary, a second on-site lined pond is available for reject water.

Wastewater Treatment Facility Information			
FDEP Water Facilities Regulation Identification	FLA013980		
Wastewater Treatment Capacity (mgd)	0.12		
Disinfection ^a	High-level		
Water Reuse?	Yes		
Public Access Users Served:			
Residences	0		
Golf Courses	1		
Parks and Schools	0		
Facility Flows (mgd)			
	2019	2045 ^b	
Total Wastewater Treated	0.04	0.04	
Total Wastewater Disposed	0.00	0.00	
Deep Injection Well	0.00	0.00	
Surface Water	0.00	0.00	
Total Water Reused	0.04	0.04	
Residential Irrigation	0.00	0.00	
Golf Course Irrigation	0.04	0.04	
Other Irrigation	0.00	0.00	
Groundwater Recharge (RIBs)	0.00	0.00	
Industrial	0.00	0.00	
Wetlands	0.00	0.00	
Other	0.00	0.00	
Supplemental to Reclaimed Water (type)	0.00	0.00	
Reuse Percentage	100%	100%	
Reclaimed Water Project Summary			
Project Name	Completion Date	Total Capital Cost (\$ million)	Added Capacity (mgd)
No Projects	--	--	--

WWTF = wastewater treatment facility; FDEP = Florida Department of Environmental Protection; mgd = million gallons per day; RIB = rapid infiltration basin.

^a High-level disinfection as described in Rule 62-600.440(5), F.A.C.

^b Service area is assumed to be at buildout. Projections are based on previous 5 years (2015 to 2019) of reported flows in the FDEP Reuse Inventory.



MEADOWOOD

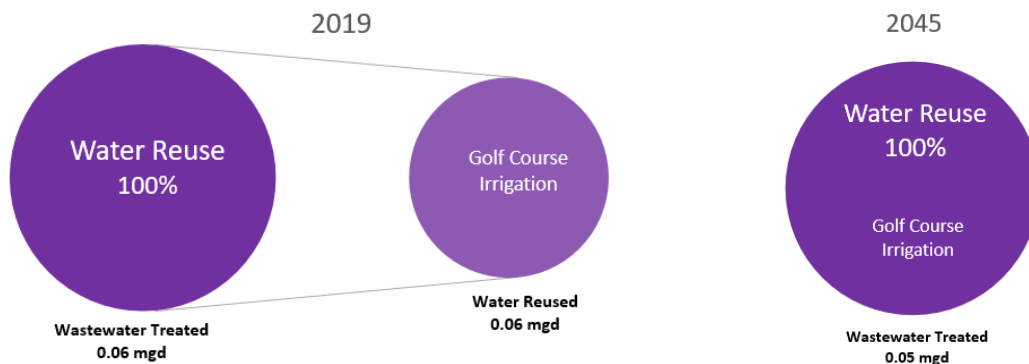
Description: The WWTF is located at 3001 Johnston Road, Fort Pierce, Florida. Reclaimed water from the facility is used for irrigation at the Meadowood Golf Course. If needed, treated wastewater can be diverted to an on-site percolation pond (rapid infiltration basin).

Wastewater Treatment Facility Information			
FDEP Water Facilities Regulation Identification		FLA013982	
Wastewater Treatment Capacity (mgd)		0.11	
Disinfection ^a		High-level	
Water Reuse?		Yes	
Public Access Users Served:			
Residences		0	
Golf Courses		1	
Parks and Schools		0	
Facility Flows (mgd)			
		2019	2045 ^b
Total Wastewater Treated		0.06	0.05
Total Wastewater Disposed		0.00	0.00
Deep Injection Well		0.00	0.00
Surface Water		0.00	0.00
Total Water Reused		0.06	0.05
Residential Irrigation		0.00	0.00
Golf Course Irrigation		0.06	0.05
Other Irrigation		0.00	0.00
Groundwater Recharge (RIBs)		0.00	0.00
Industrial		0.00	0.00
Wetlands		0.00	0.00
Other		0.00	0.00
Supplemental to Reclaimed Water (type)		0.00	0.00
Reuse Percentage		100%	100%
Reclaimed Water Project Summary			
Project Name	Completion Date	Total Capital Cost (\$ million)	Added Capacity (mgd)
No Projects	--	--	--

WWTF = wastewater treatment facility; FDEP = Florida Department of Environmental Protection; mgd = million gallons per day; RIB = rapid infiltration basin.

^a High-level disinfection as described in Rule 62-600.440(5), F.A.C.

^b Service area is assumed to be at buildout. Projections are based on previous 5 years (2015 to 2019) of reported flows in the FDEP Reuse Inventory.



PORT ST. LUCIE – GLADES

Description: The WWTF is located at 10700 NW Cut-off Road, Port St. Lucie, Florida. The Glades facility uses reclaimed water solely for on-site industrial purposes. Most of the treated effluent is disposed of through an on-site deep injection well, with a permit for alternate disposal at the James E. Anderson water treatment plant's deep injection well. The facility is permitted to use reclaimed water for urban irrigation, but the distribution system has not yet been completed.

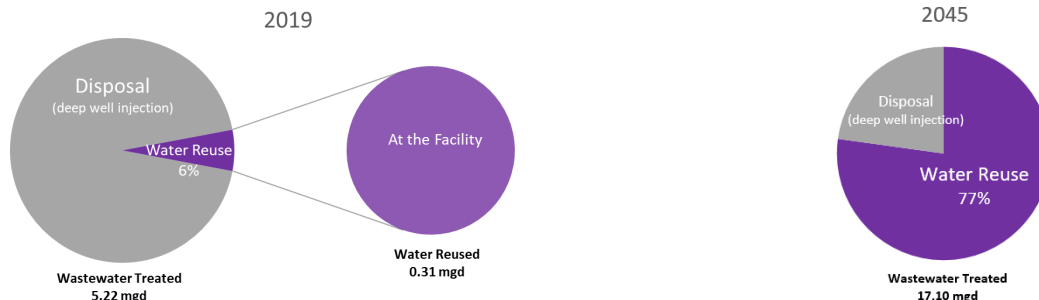
Wastewater Treatment Facility Information			
FDEP Water Facilities Regulation Identification	FLA326321		
Wastewater Treatment Capacity (mgd)	12.00		
Disinfection ^a	High-level		
Water Reuse?	Yes		
Public Access Users Served:			
Residences	0		
Golf Courses	0		
Parks and Schools	0		
Facility Flows (mgd)			
	2019	2045 ^b	
Total Wastewater Treated	5.22	17.10	
Total Wastewater Disposed	4.91	3.90	
Deep Injection Well	4.91	3.90	
Surface Water	0.00	0.00	
Total Water Reused	0.31	13.20^c	
Residential Irrigation	0.00	4.40	
Golf Course Irrigation	0.00	4.40	
Other Irrigation	0.00	4.40	
Groundwater Recharge (RIBs)	0.00	0.00	
Industrial (at the facility)	0.31	0.00	
Wetlands	0.00	0.00	
Other	0.00	0.00	
Supplemental to Reclaimed Water (type)	0.00	0.00	
Reuse Percentage	6%	77%	
Reclaimed Water Project Summary			
Project Name	Completion Date	Total Capital Cost (\$ million)	Added Capacity (mgd)
Glades reuse water to Tradition	12/31/2021	3.70	5.00
WWTF expansion and interconnect with Westport WWTF	12/31/2045	90.00	6.00

WWTF = wastewater treatment facility; FDEP = Florida Department of Environmental Protection; mgd = million gallons per day; RIB = rapid infiltration basin.

^a High-level disinfection as described in Rule 62-600.440(5), F.A.C.

^b Data provided by the utility.

^c Reclaimed water is projected to be used for irrigation, split evenly among residential, golf course, and other (e.g., parks).



PORT ST. LUCIE – WESTPORT

Description: The WWTF is located at 3721 SW Darwin Boulevard, Port St. Lucie, Florida. The Westport facility provides reclaimed water to four golf courses: Floridian Golf & Yacht Club, Santa Lucia Golf River Club (Ballantrae), Tesoro Club, and Veranda Gardens West. Three on-site percolation ponds (rapid infiltration basins) are available, if needed. The remaining treated effluent is disposed of through deep well injection.

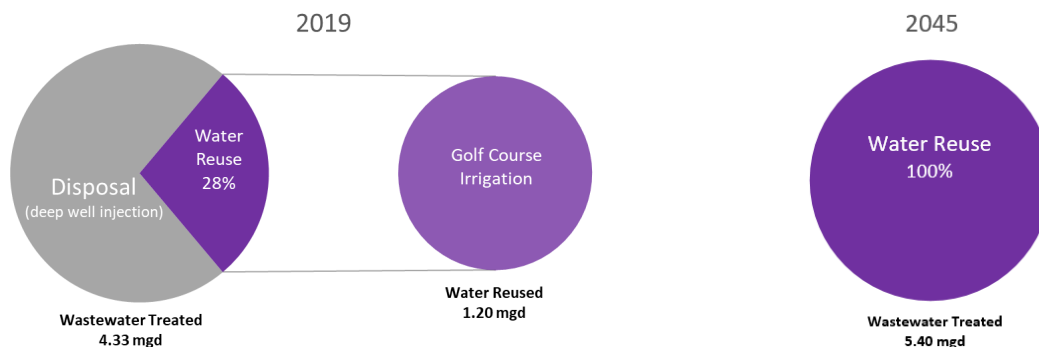
Wastewater Treatment Facility Information			
FDEP Water Facilities Regulation Identification		FLA139653	
Wastewater Treatment Capacity (mgd)		6.00	
Disinfection ^a		High-level	
Water Reuse?		Yes	
Public Access Users Served:			
Residences		0	
Golf Courses		4	
Parks and Schools		0	
Facility Flows (mgd)			
		2019	2045 ^b
Total Wastewater Treated		4.33	5.40
Total Wastewater Disposed		3.13	0.00
Deep Injection Well		3.13	0.00
Surface Water		0.00	0.00
Total Water Reused		1.20	5.40 ^c
Residential Irrigation		0.00	1.80
Golf Course Irrigation		1.20	1.80
Other Irrigation		0.00	1.80
Groundwater Recharge (RIBs)		0.00	0.00
Industrial		0.00	0.00
Wetlands		0.00	0.00
Other		0.00	0.00
Supplemental to Reclaimed Water (type)		0.00	0.00
Reuse Percentage		28%	100%
Reclaimed Water Project Summary			
Project Name	Completion Date	Total Capital Cost (\$ million)	Added Capacity (mgd)
No Projects	--	--	--

WWTF = wastewater treatment facility; FDEP = Florida Department of Environmental Protection; mgd = million gallons per day; RIB = rapid infiltration basin.

^a High-level disinfection as described in Rule 62-600.440(5), F.A.C.

^b Data provided by the utility.

^c Reclaimed water is projected to be used for irrigation, split evenly among residential, golf course, and other (e.g., parks).



SAVANNA CLUB

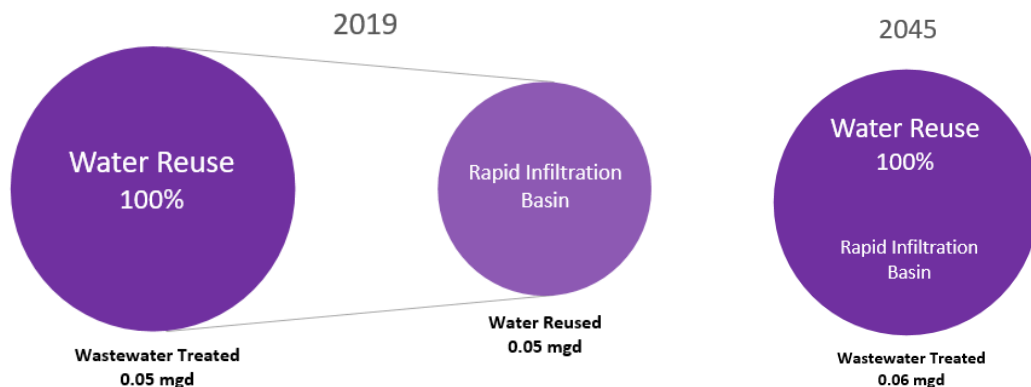
Description: The WWTF is located at 3492 Crabapple Drive, Port St. Lucie, Florida. Chlorinated effluent from the treatment facility is discharged alternately to two percolation ponds (rapid infiltration basins).

Wastewater Treatment Facility Information			
FDEP Water Facilities Regulation Identification	FLA013958		
Wastewater Treatment Capacity (mgd)	0.15		
Disinfection ^a	Basic		
Water Reuse?	Yes		
Public Access Users Served:			
Residences	0		
Golf Courses	0		
Parks and Schools	0		
Facility Flows (mgd)			
	2019	2045 ^b	
Total Wastewater Treated	0.05	0.06	
Total Wastewater Disposed	0.00	0.00	
Deep Injection Well	0.00	0.00	
Surface Water	0.00	0.00	
Total Water Reused	0.05	0.06	
Residential Irrigation	0.00	0.00	
Golf Course Irrigation	0.00	0.00	
Other Irrigation	0.00	0.00	
Groundwater Recharge (RIBs)	0.05	0.06	
Industrial	0.00	0.00	
Wetlands	0.00	0.00	
Other	0.00	0.00	
Supplemental to Reclaimed Water (type)	0.00	0.00	
Reuse Percentage	100%	100%	
Reclaimed Water Project Summary			
Project Name	Completion Date	Total Capital Cost (\$ million)	Added Capacity (mgd)
No Projects	--	--	--

WWTF = wastewater treatment facility; FDEP = Florida Department of Environmental Protection; mgd = million gallons per day; RIB = rapid infiltration basin.

^a Basic disinfection as described in Rule 62-600.440(4), F.A.C.

^b Service area is assumed to be at buildout. Projections are based on previous 5 years (2015 to 2019) of reported flows in the FDEP Reuse Inventory.



SPANISH LAKES COUNTRY CLUB

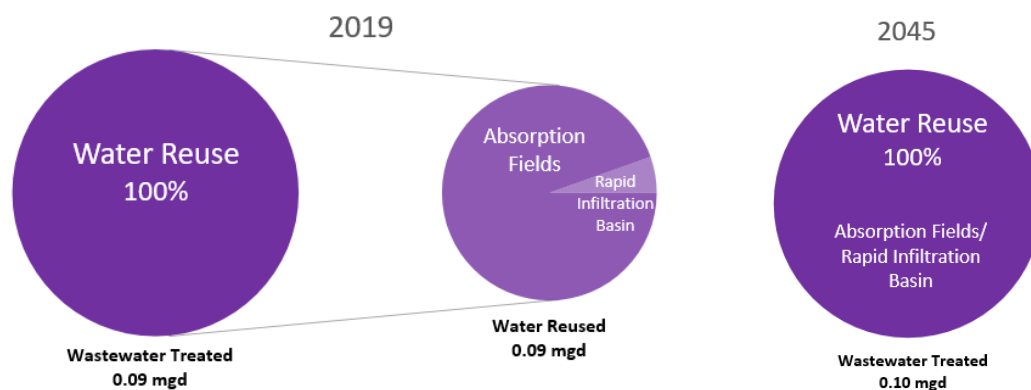
Description: The WWTF is located near the intersection of La Villa Way and Calle De Lagos, Fort Pierce, Florida. Treated wastewater from the facility is sent to an absorption field system consisting of three drain fields and two percolation ponds.

Wastewater Treatment Facility Information			
FDEP Water Facilities Regulation Identification	FLA013977		
Wastewater Treatment Capacity (mgd)	0.16		
Disinfection ^a	Basic		
Water Reuse?	Yes		
Public Access Users Served:			
Residences	0		
Golf Courses	0		
Parks and Schools	0		
Facility Flows (mgd)			
	2019	2045 ^b	
Total Wastewater Treated	0.09	0.10	
Total Wastewater Disposed	0.00	0.00	
Deep Injection Well	0.00	0.00	
Surface Water	0.00	0.00	
Total Water Reused	0.09	0.10	
Residential Irrigation	0.00	0.00	
Golf Course Irrigation	0.00	0.00	
Other Irrigation	0.00	0.00	
Groundwater Recharge (RIBs)	0.00	0.00	
Industrial	0.00	0.00	
Wetlands	0.00	0.00	
Other (absorption field)	0.09	0.10	
Supplemental to Reclaimed Water (type)	0.00	0.00	
Reuse Percentage	100%	100%	
Reclaimed Water Project Summary			
Project Name	Completion Date	Total Capital Cost (\$ million)	Added Capacity (mgd)
No Projects	--	--	--

WWTF = wastewater treatment facility; FDEP = Florida Department of Environmental Protection; mgd = million gallons per day; RIB = rapid infiltration basin.

^a Basic disinfection as described in Rule 62-600.440(4), F.A.C.

^b Service area is assumed to be at buildout. Projections are based on previous 5 years (2015 to 2019) of reported flows in the FDEP Reuse Inventory.



SPANISH LAKES FAIRWAYS

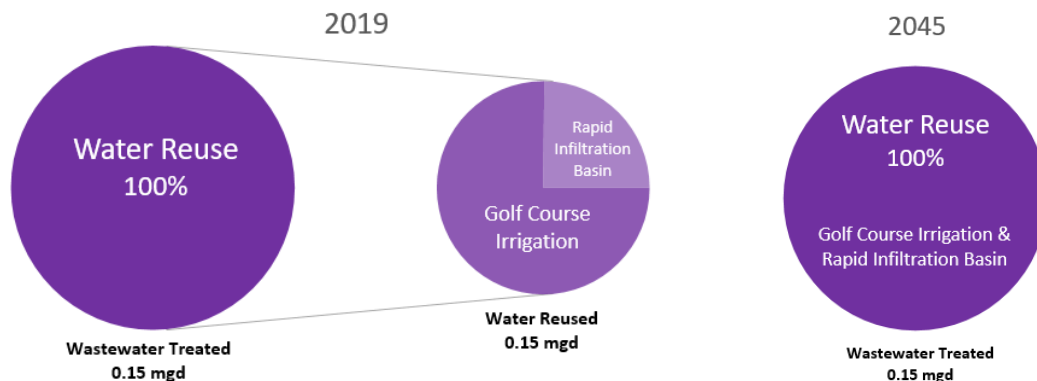
Description: The WWTF is located at the intersection of Aguila Avenue and Alemendra Street in Fort Pierce, Florida. The treatment facility provides reclaimed water to the Spanish Lakes Fairways golf course. A lined pond at the facility is available for storage. Three percolation ponds (rapid infiltration basins) for groundwater recharge are an alternative for irrigation of reclaimed water.

Wastewater Treatment Facility Information			
FDEP Water Facilities Regulation Identification	FLA013998		
Wastewater Treatment Capacity (mgd)	0.25		
Disinfection ^a	High-level		
Water Reuse?	Yes		
Public Access Users Served:			
Residences	0		
Golf Courses	1		
Parks and Schools	0		
Facility Flows (mgd)			
	2019	2045 ^b	
Total Wastewater Treated	0.15	0.15	
Total Wastewater Disposed	0.00	0.00	
Deep Injection Well	0.00	0.00	
Surface Water	0.00	0.00	
Total Water Reused	0.15	0.15	
Residential Irrigation	0.00	0.00	
Golf Course Irrigation	0.11	0.11	
Other Irrigation	0.00	0.00	
Groundwater Recharge (RIBs)	0.04	0.04	
Industrial	0.00	0.00	
Wetlands	0.00	0.00	
Other	0.00	0.00	
Supplemental to Reclaimed Water (type)	0.00	0.00	
Reuse Percentage	100%	100%	
Reclaimed Water Project Summary			
Project Name	Completion Date	Total Capital Cost (\$ million)	Added Capacity (mgd)
No Projects	--	--	--

WWTF = wastewater treatment facility; FDEP = Florida Department of Environmental Protection; mgd = million gallons per day; RIB = rapid infiltration basin.

^a High-level disinfection as described in Rule 62-600.440(5), F.A.C.

^b Service area is assumed to be at buildout. Projections are based on the 2019 reported flows in the FDEP Reuse Inventory.



ST. LUCIE COUNTY – NORTH (HOLIDAY PINES)

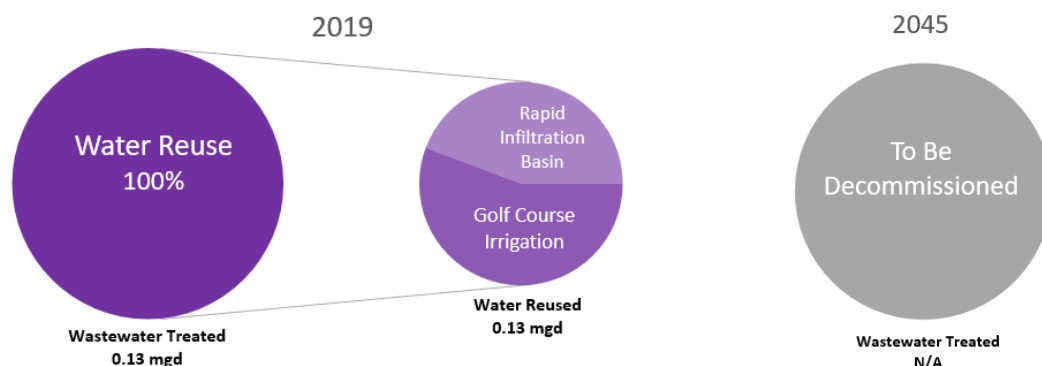
Description: The WWTF is located at 5804 Indian Pines Boulevard, Fort Pierce, Florida. This treatment facility provides reclaimed water for irrigation at the Island Pines Golf Course. Excess reclaimed water and any treated wastewater not meeting standards is diverted to seven on-site rapid infiltration basins. The Holiday Pines WWTF is expected to be replaced by the North County Regional WWTF when it comes online.

Wastewater Treatment Facility Information			
FDEP Water Facilities Regulation Identification	FLA013969		
Wastewater Treatment Capacity (mgd)	0.30		
Disinfection ^a	High-level		
Water Reuse?	Yes		
Public Access Users Served:			
Residences	0		
Golf Courses	1		
Parks and Schools	0		
Facility Flows (mgd)			
	2019	2045 ^b	
Total Wastewater Treated	0.13	--	
Total Wastewater Disposed	0.00	--	
Deep Injection Well	0.00	--	
Surface Water	0.00	--	
Total Water Reused	0.13	--	
Residential Irrigation	0.00	--	
Golf Course Irrigation	0.07	--	
Other Irrigation	0.00	--	
Groundwater Recharge (RIBs)	0.06	--	
Industrial	0.00	--	
Wetlands	0.00	--	
Other	0.00	--	
Supplemental to Reclaimed Water (type)	0.00	--	
Reuse Percentage	100%	--	
Reclaimed Water Project Summary			
Project Name	Completion Date	Total Capital Cost (\$ million)	Added Capacity (mgd)
No Projects	--	--	--

WWTF = wastewater treatment facility; FDEP = Florida Department of Environmental Protection; mgd = million gallons per day; RIB = rapid infiltration basin.

^a High-level disinfection as described in Rule 62-600.440(5), F.A.C.

^b Per utility-provided information, the facility is to be decommissioned when the North County Regional WWTF comes online.



ST. LUCIE COUNTY – NORTH COUNTY REGIONAL (PROPOSED)

Description: The proposed North County Regional WWTF is planned to be constructed on a parcel northwest of the airport along Taylor Dairy Road and Indrio Road in Lakewood Park, Florida. The initial treatment capacity is expected to be between 2.00 and 4.00 mgd, depending on development in the area. The facility will accept flows from the existing Holiday Pines WWTF, Fairwinds, Lakewood Park, and developments along the Indrio Road and North U.S. Highway 1 corridors. The facility is planned to be a 100% water reuse facility, with wet weather disposal through a proposed deep injection well.

Wastewater Treatment Facility Information			
FDEP Water Facilities Regulation Identification	--		
Wastewater Treatment Capacity (mgd)	2.00 to 4.00		
Disinfection	--		
Water Reuse?	Yes		
Public Access Users Served:			
Residences	--		
Golf Courses	--		
Parks and Schools	--		
Facility Flows (mgd)			
	2019	2045	
Total Wastewater Treated	--	2.00 to 4.00^a	
Total Wastewater Disposed	--	1.00^b	
Deep Injection Well	--	1.00	
Surface Water	--	0.00	
Total Water Reused	--	3.00^c	
Residential Irrigation	--	1.00	
Golf Course Irrigation	--	1.00	
Other Irrigation	--	1.00	
Groundwater Recharge (RIBs)	--	0.00	
Industrial	--	0.00	
Wetlands	--	0.00	
Other	--	0.00	
Supplemental to Reclaimed Water (type)	--	0.00	
Reuse Percentage	--	75%	
Reclaimed Water Project Summary			
Project Name	Completion Date	Total Capital Cost (\$ million)	Added Capacity (mgd)
No Projects	--	--	--

WWTF = wastewater treatment facility; FDEP = Florida Department of Environmental Protection; mgd = million gallons per day; RIB = rapid infiltration basin.

^a WWTF capacity range provided by the utility. The projected 2045 wastewater flow is assumed to be 4.00 mgd.

^b Wet weather disposal through deep well injection will be needed; therefore, an annual average reuse percentage of 75% is assumed.

^c Reclaimed water is projected to be used for irrigation, split evenly among residential, golf course, and other (e.g., parks).



ST. LUCIE COUNTY – NORTH HUTCHINSON ISLAND

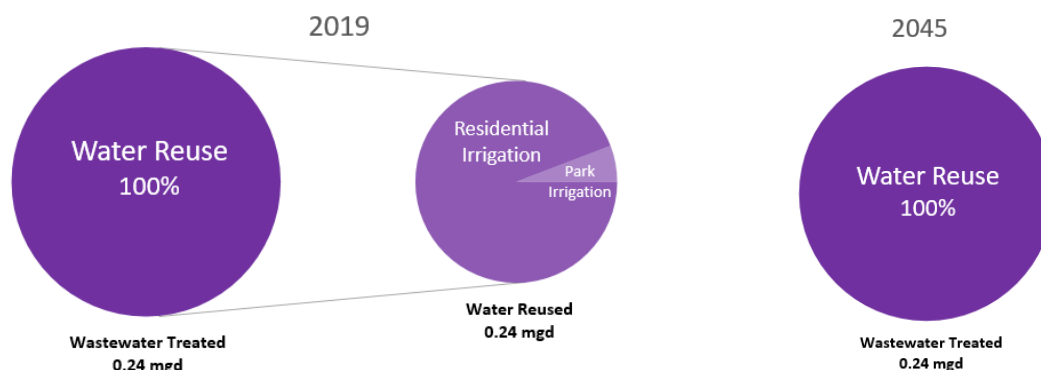
Description: The WWTF is located on State Road A1A (Atlantic Beach Boulevard) on North Hutchinson Island in Fort Pierce, Florida. The treatment facility provides reclaimed water for irrigation of residential developments and Pepper Park and for dune line irrigation and restoration.

Wastewater Treatment Facility Information			
FDEP Water Facilities Regulation Identification	FLA013946		
Wastewater Treatment Capacity (mgd)	0.85		
Disinfection ^a	High-level		
Water Reuse?	Yes		
Public Access UsersServed:			
Residences	155		
Golf Courses	0		
Parks and Schools	1		
Facility Flows (mgd)			
	2019	2045 ^b	
Total Wastewater Treated	0.24	0.24	
Total Wastewater Disposed	0.00	0.00	
Deep Injection Well	0.00	0.00	
Surface Water	0.00	0.00	
Total Water Reused	0.24	0.24	
Residential Irrigation	0.23	0.23	
Golf Course Irrigation	0.00	0.00	
Other Irrigation	0.01	0.01	
Groundwater Recharge (RIBs)	0.00	0.00	
Industrial	0.00	0.00	
Wetlands	0.00	0.00	
Other	0.00	0.00	
Supplemental to Reclaimed Water (type)	0.00	0.00	
Reuse Percentage	100%	100%	
Reclaimed Water Project Summary			
Project Name	Completion Date	Total Capital Cost (\$ million)	Added Capacity (mgd)
No Projects	--	--	--

WWTF = wastewater treatment facility; FDEP = Florida Department of Environmental Protection; mgd = million gallons per day; RIB = rapid infiltration basin.

^a High-level disinfection as described in Rule 62-600.440(5), F.A.C.

^b Service area is assumed to be at/near buildout. Projections are based on the 2019 reported flows in the FDEP Reuse Inventory.



ST. LUCIE COUNTY – SOUTH HUTCHINSON ISLAND

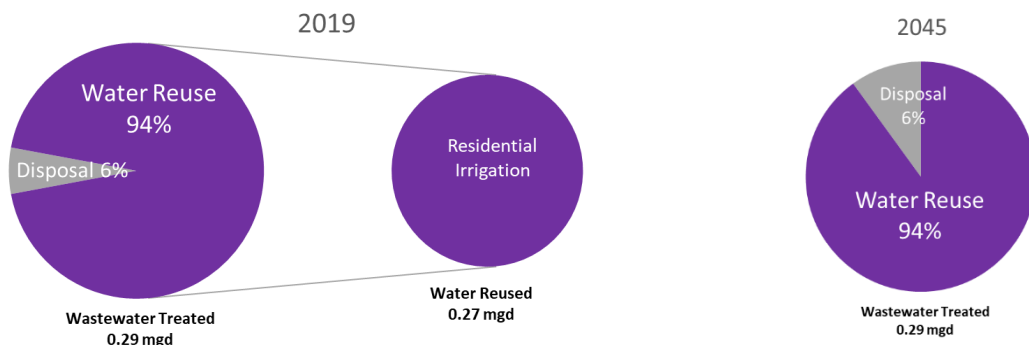
Description: The WWTF is located on South Hutchinson Island at 7601 South Ocean Drive, Jensen Beach, Florida. The treatment facility provides reclaimed water from the St. Lucie/Martin county line north to the limits of the WWTF's service area. Major users include the Island Development Group/Ocean Planned Unit Development, John Brooks Park, and Fredrick Douglas Park. The WWTF has a permit to discharge effluent into Florida Power & Light's discharge canal, which flows to the Atlantic Ocean, as backup disposal to irrigation.

Wastewater Treatment Facility Information			
FDEP Water Facilities Regulation Identification	FL0139475		
Wastewater Treatment Capacity (mgd)	1.60		
Disinfection ^a	High-level		
Water Reuse?	Yes		
Public Access Users Served:			
Residences	104		
Golf Courses	0		
Parks and Schools	0		
Facility Flows (mgd)			
	2019	2045 ^b	
Total Wastewater Treated	0.29	0.29	
Total Wastewater Disposed	0.02	0.02	
Deep Injection Well	0.00	0.00	
Surface Water	0.02	0.02	
Total Water Reused	0.27	0.27	
Residential Irrigation	0.27	0.27	
Golf Course Irrigation	0.00	0.00	
Other Irrigation	0.00	0.00	
Groundwater Recharge (RIBs)	0.00	0.00	
Industrial	0.00	0.00	
Wetlands	0.00	0.00	
Other	0.00	0.00	
Supplemental to Reclaimed Water (type)	0.00	0.00	
Reuse Percentage	93%	93%	
Reclaimed Water Project Summary			
Project Name	Completion Date	Total Capital Cost (\$ million)	Added Capacity (mgd)
No Projects	--	--	--

WWTF = wastewater treatment facility; FDEP = Florida Department of Environmental Protection; mgd = million gallons per day; RIB = rapid infiltration basin.

^a High-level disinfection as described in Rule 62-600.440(5), F.A.C.

^b Service area is assumed to be at/near buildout. Projections are based on the 2019 reported flows in the FDEP Reuse Inventory.



ST. LUCIE WEST SERVICES DISTRICT

Description: The WWTF is located at 450 SW Utility Drive, Port St. Lucie, Florida. The St. Lucie West Services District provides wastewater services to more than 6,700 residences and delivers reclaimed water for irrigation to more than 5,100 residences, in addition to golf courses, parks, schools, and medians. Supplemental sources include surface water from Lakes Charles and Ernie as well as groundwater from five shallow wells and three potable water supply wells. A lined reclaimed water pond is located at the WWTF site for storage.

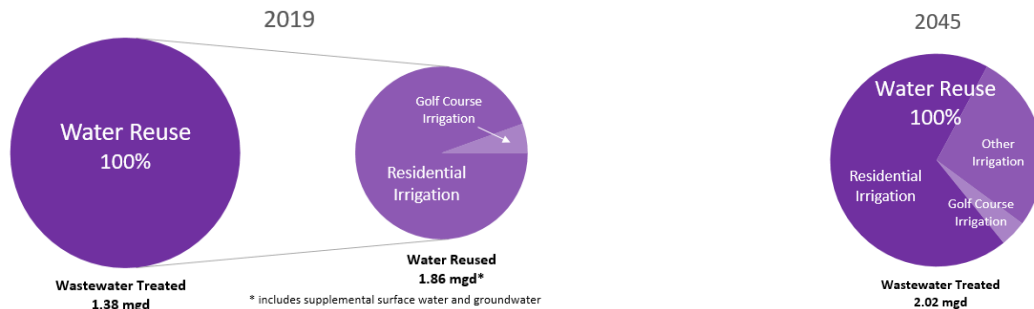
Wastewater Treatment Facility Information			
FDEP Water Facilities Regulation Identification		FLA013993	
Wastewater Treatment Capacity (mgd)		2.13	
Disinfection ^a		High-level	
Water Reuse?		Yes	
Public Access Users Served:			
Residences		5,162	
Golf Courses		3	
Parks and Schools		15	
Facility Flows (mgd)			
		2019	2045 ^b
Total Wastewater Treated		1.38	2.02
Total Wastewater Disposed		0.00	0.00
Deep Injection Well		0.00	0.00
Surface Water		0.00	0.00
Total Water Reused		1.86 ^c	2.97
Residential Irrigation		1.76	2.04
Golf Course Irrigation		0.10	0.12
Other Irrigation		0.00	0.81
Groundwater Recharge (RIBs)		0.00	0.00
Industrial		0.00	0.00
Wetlands		0.00	0.00
Other		0.00	0.00
Supplemental to Reclaimed Water (type)		0.45 (surface water) 0.03 (groundwater)	0.95 (surface water and groundwater)
Reuse Percentage		100%	100%
Reclaimed Water Project Summary			
Project Name	Completion Date	Total Capital Cost (\$ million)	Added Capacity (mgd)
No Projects	--	--	--

WWTF = wastewater treatment facility; FDEP = Florida Department of Environmental Protection; mgd = million gallons per day; RIB = rapid infiltration basin.

^a High-level disinfection as described in Rule 62-600.440(5), F.A.C.

^b Data provided by the utility.

^c Total reuse is greater than total wastewater treated due to additional supplemental groundwater use.



REFERENCES

FDEP. 2020. *2019 Reuse Inventory*. Water Reuse Program, Florida Department of Environmental Protection, Tallahassee, FL.



South Florida Water Management District is committed to managing and protecting our region's water resources

Meeting South Florida's water supply needs while safeguarding its natural systems requires innovative solutions, cohesive planning, and a shared vision.



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